MIDWAY

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Operations Manual

- •Game Operation & Adjustments
- •Game Testing & Problem Diagnosis
- •Parts Information
- •Wiring Diagrams & Schematics

After the war in the year 1999, reporters and other civilians are missing in the war zone.

The United States Government sends in the doomsday squad to rescue the hostages and to capture the evil dictator who is holding them.

In addition, the evil dictator, General Akhboob, is creating mutant life forms at his bio-nuclear research facility.

It must be destroyed!

TOTAL CARNAGE GAME RULES:

Guide Captain Carnage and Major Mayhem through Total Carnage in pursuit of General Akhboob.

Left joystick moves player/Right joystick fires weapons.

Pick up icons for weapon upgrade and bonus points.

Rescue all military and civilian hostages.

Use Start/Bomb button to drop time bombs or to call in an air to surface missile strike.

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NOTES

TOTAL CARNAGE

SECTION
ONE

Operation

Safety Notices

The following safety instructions apply to all game operators and service personnel. Specific warnings and cautions will be found throughout this manual where they apply. We recommend that you read this page before preparing your game for play.

⚠ CAUTION

AC POWER CONNECTION. Before connecting the game to the AC power source, verify that the "line voltage selection chart" jumper wires are installed correctly for the line voltage in your area. For details, refer to Section 3.

PROPERLY GROUND THE GAME. To avoid electrical shocks, do not plug in the game until it has been inspected and properly grounded. MIDWAY games should only be plugged into a grounded 3-wire outlet. Shocks will also result, if the control panel is not properly grounded! After servicing any parts on the panel, be sure that the ground wires are secure. Only then should you lock up the game.

DISCONNECT POWER DURING REPAIRS. To avoid electrical shock, disconnect the game from the AC power source before removing or repairing any part of the game.

USE THE PROPER FUSE. To avoid electrical shock, use the replacement fuse which is specified in the parts list for this game. The replacement fuse must match the original fuse in fuse type, voltage rating, and current rating.

MONITOR PRECAUTIONS. When removing or repairing the monitor, extra precautions must be taken to avoid electrical shock. High voltages may exist within the monitor circuitry and cathode ray tube (CRT) even after power has been disconnected. Do not touch internal parts of the monitor with your hands or metal objects! Always discharge the CRT by the following method: Attach one end of a large, well-insulated, 20-kv jumper to ground. Momentarily touch the free end of the grounded jumper to the anode by sliding it under the anode cap. Wait two minutes and discharge the anode again.

HANDLE FLUORESCENT TUBE AND CRT WITH CARE. If you drop a fluorescent tube or CRT and it breaks, it will implode! Shattered glass can fly eight feet or more from the implosion.

ATTENTION!

PROPERLY ATTACH ALL CONNECTORS. *Make sure that the connectors on each printed circuit board (PCB) are properly connected. If the connectors do not slip on easily, do not force them. A reversed connector may damage your game and void the warranty. All connectors are keyed to fit specific pins on each board.*

Setup Procedure

Game Location Requirements

Power:	Domestic 115V @ 60 Hz Foreign 230V @ 60 Hz	*Dimensions:*	Width: 37" Depth: 41 1/2"
Temp.:	32° F to 100° F (0° C to 38° C)		Height: 73"
Humidity:	Not to exceed 95% relative.	*Weight:*	Approx. 375 Lbs.

Installation And Inspection

1. Remove all items from shipping container and set them aside. Inspect the exterior of the cabinet for any signs of damage. Remove the shipping cleats from the bottom of the cabinet.

2. Remove keys from the taped coin return slot (or attached to Joystick). Unlock and open the coin and cash box doors. (Leg levelers and spare parts are stored in the cash box).

3. Tilt or lay the cabinet down. Locate the four threaded holes on the bottom of the cabinet (one in each corner) and install one leg leveler (with its hex nut) in each hole.

4. Stand the cabinet upright and make certain that it is in a stable position. Level the cabinet.

5. Remove the rear door of the cabinet. Inspect the interior for any signs of damage. Check all major assemblies to assure that they are mounted securely.

6. Refer to the games Cabinet Wiring Diagram (section 3), and check to see that all cable connectors are correctly secured. DO NOT FORCE CONNECTIONS. Watch for damaged connectors and avoid making reversed connections.

7. Install the control panel housing. Follow instruction sheet packed with control panel and housing.)

8. Determine the value of your line voltage with a meter. Then, check the power input wires to the main power supply transformer on your game to be sure they are connected to taps which correspond to your local line voltage value. If necessary, reconnect the power input wires to the transformer in accordance with the Transformer Chart in Section 3.

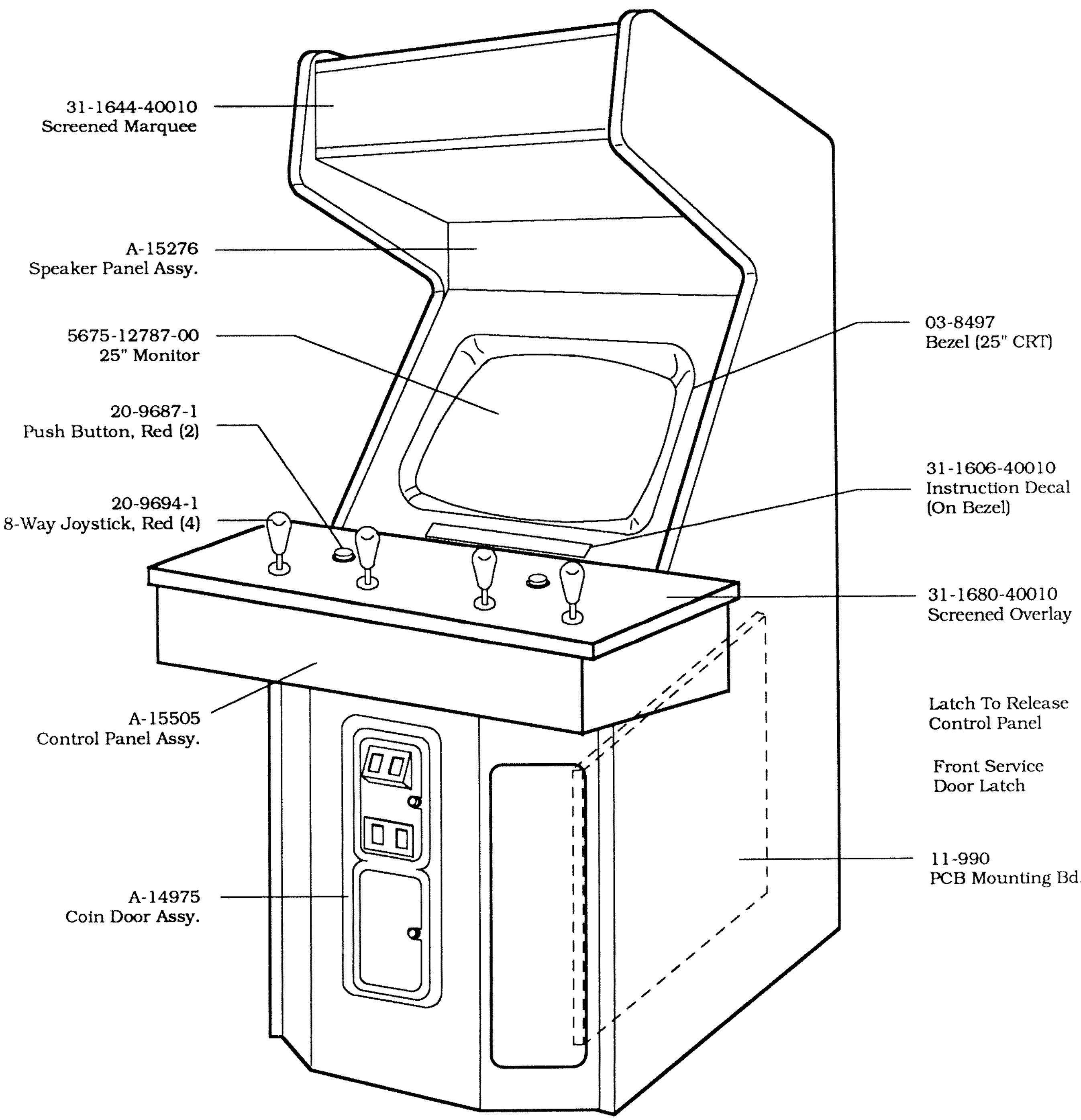
If the line voltage in your area falls outside the upper or lower limits of the range of voltage inputs covered by the main power supply transformer, DO NOT PLUG YOUR GAME IN until you have contacted your distributor or the MIDWAY Service Department and obtained a solution to the problem. Otherwise, you could damage your game.

9. Lay the line cord (connected to the Power Chassis) in the slot along the bottom edge of the rear cabinet door. Replace the rear cabinet door and screw (lock) it securely. Close and lock the front coin and cash box doors.

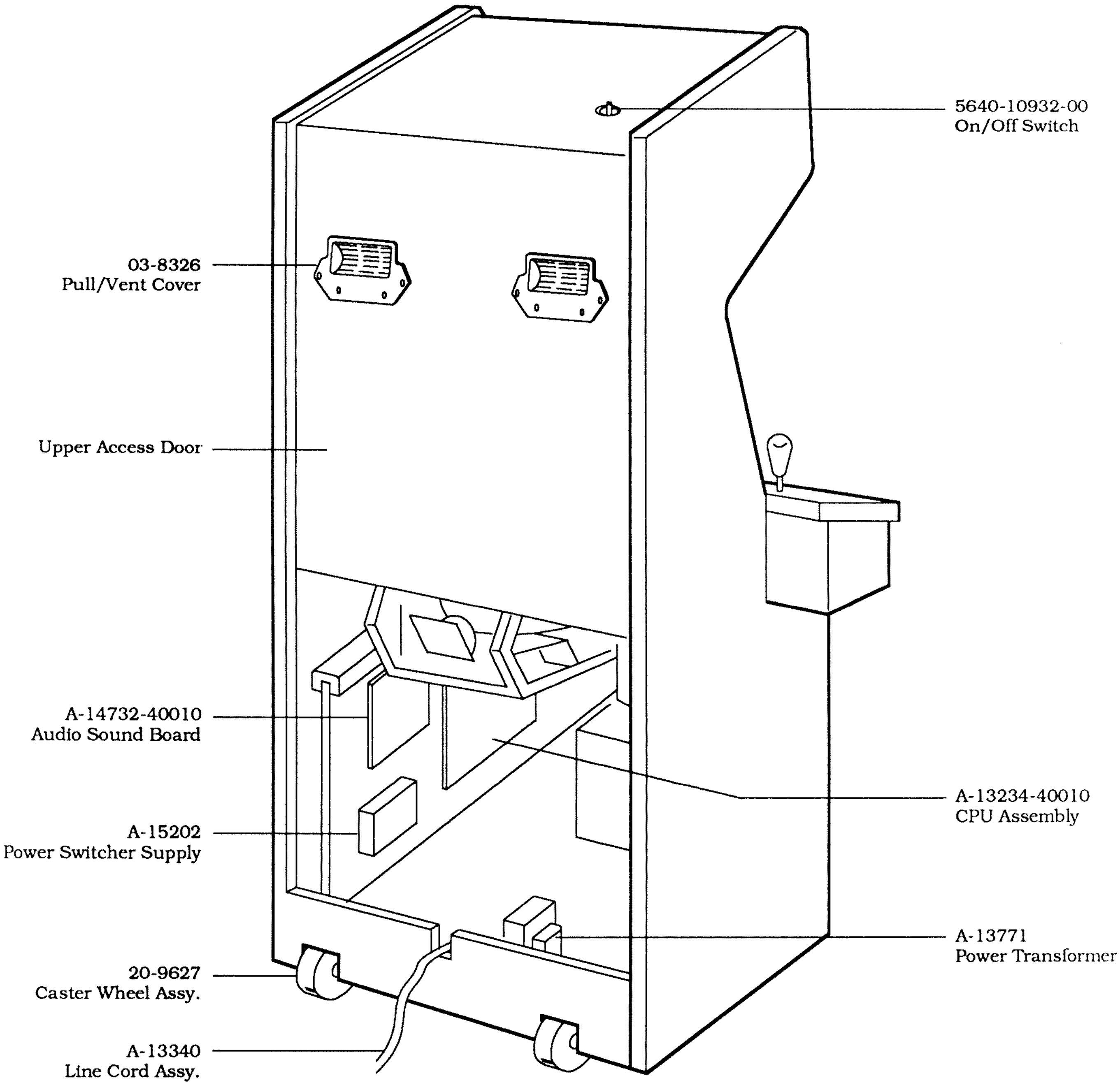
10. Connect the line cord to a grounded (3-terminal) AC wall outlet.

11. Switch ON the game using the ON/OFF switch located on the upper left rear of the cabinet, to verify proper operation.

TOTAL CARNAGE Assembly
(Front View)



TOTAL CARNAGE Assembly
(Rear View)



Servicing

■ Control Panel

Switch OFF power to the game. The control panel is held in place by four latches (located inside the cabinet, on the left and right sides of the control panel) which provide constant pressure on the strikes. The latches can be reached through the coin door opening. To release the latches, lift the latch handle and unhook the wire fasteners. Carefully use the joysticks to lift the control panel. Tilt the control panel back until it rests on its support brackets. To reinstall the control panel, check for proper cable connections, including the ground strap and use the joysticks to lower it into position, avoiding pinched wires. Re-clamp the latches.

NOTE

To remove the control panel for bench servicing, reach through the coin door opening and release the latches located on the sides of the control panel. Be careful not to reach straight back through the coin door opening as you might damage the monitors remote controls board. Tilt the control panel until it rests on its support brackets. Disconnect the cables and the ground strap. Lift the control panel out of the game cabinet.

■ Remove Viewing Glass

Switch OFF power to the game and open the control panel. Carefully lift the glass from its bottom grooved edge and lift it clear of cabinet.

■ Remove Monitor Bezel

Switch OFF power to the game and remove the viewing glass. Remove the bezel securing screws to free the monitor bezel.

■ Monitor Replacement

We recommend that you read the WARNINGS section thoroughly before beginning this procedure.

Switch OFF power to the game. Remove the viewing glass and the monitor bezel. Completely disconnect the monitor from all of its cabling, including its chassis ground strap.

Remove the four bolts securing the monitors mounting flanges to its mounting panel. Pull the monitor carefully from the cabinet front.

⚠**CAUTION** *While removing the four bolts, firmly support the monitor from the front of the CRT so that it will not slip.*

⚠**CAUTION** *The monitor DOES NOT contain an isolation transformer in its chassis. It is mounted instead in the Power Chassis Assembly locate on the floor of the Cabinet. When servicing the monitor on a test bench, YOU MUST ISOLATE THE MONITOR FROM THE LINE VOLTAGE WITH AN ISOLATION TRANSFORMER.*

Remove Marquee Glass

Switch OFF power to the game. Remove the screws in the back plastic strip on top of the cabinet. Remove the strip and carefully lift the glass. Store the glass carefully to prevent damage.

The fluorescent tube is now accessible for replacement. Grasp the tube, give it a quarter turn and remove it from its socket. Carefully place a new tube into the socket and turn to reinstall.

WARNING

If a fluorescent tube drops and it breaks, it will implode!
Use care in handling.

Remove Fluorescent Light Assembly

Switch OFF power to the game. Remove the marquee glass. Disconnect the fluorescent light assembly from its power cable. Remove the screws fastening the assembly to the cabinet and lift out the assembly.

Remove Speakers

Switch OFF power to the game. Remove the steel speaker screen. Remove the baffle, taking care not to damage the speaker enclosure seals. The speakers pull out from the front of the cabinet. Be sure to disconnect the cabling and remove the nuts on the mounting bolts before attempting to pull the speakers out of their enclosure. The speakers are mounted in an acoustical enclosure, carefully reinstall the seals upon completing any task in the speaker enclosure.

Volume Control, Test/Diagnostics Switch, and Service Credit Switch

Open the coin door to locate the games volume control and diagnostic switches on the small panel atop the cash box cover. The Volume Control is the white knob on the left end of the panel. Turning the knob clockwise increases the volume. The upper right switch on the bracket is the Test/Diagnostics Switch that enables activating the games test mode. The lower right switch is the Service Credit Switch, which allows adding credits to a game for service testing without affecting the games bookkeeping total.

Game Features

Total Carnage is a one or two player game.

Starting Up

Switch ON power to the game. A "rug" pattern appears on the CRT screen. When the "rug" pattern ends, the screen shows CHECKING SCRATCH RAMS, and then CHECKING ROMS. The next screen shows TOTAL CARNAGE REVISION LEVEL, CMOS TEST OK, and the COIN SETTING. The game then moves to the Attract Mode.

Insert the desired amount of coins or tokens. Select which player receives the credit by pressing the appropriate Player Start Button.

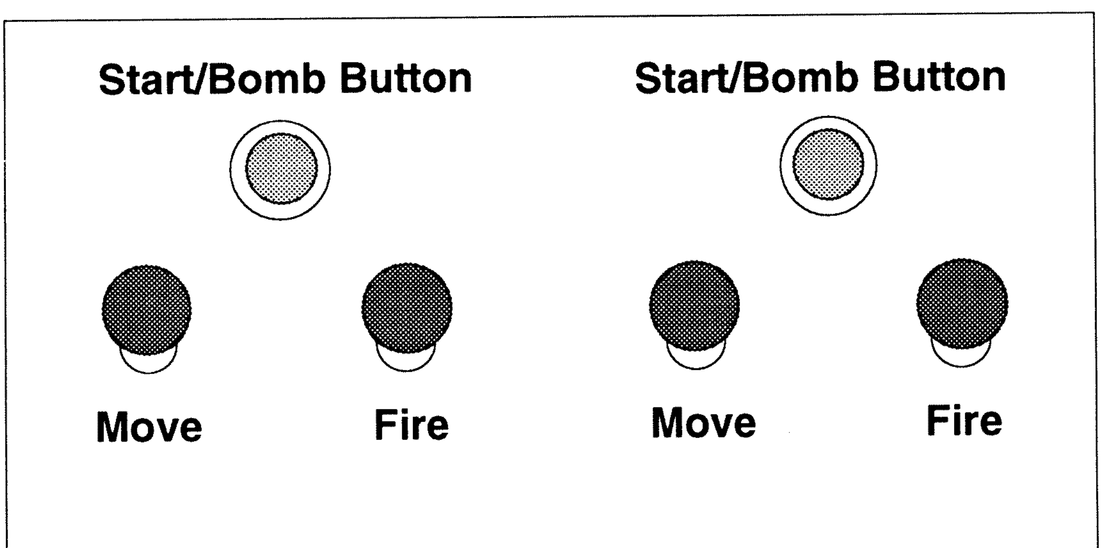
NOTE: When an error is detected during Start-up Tests, game start-up does not progress, and an error message appears on the screen.

Player Controls

- **Start/Bomb Button**
  Each Start/Bomb Button allows the corresponding player to begin game play, and during play, that same button will allow a player to set down a time bomb.

- **Left Joystick**
  Each players Left Joystick controls the eight-way movement of their on screen player.

- **Right Joystick**
  Each players Right Joystick fires the current weapon, held by their on the screen player, in any of eight directions.



Control Panel

Game Operation

The TOTAL CARNAGE Control Switches are located inside the coin door. These switches allow the operator to customize some features of the game.

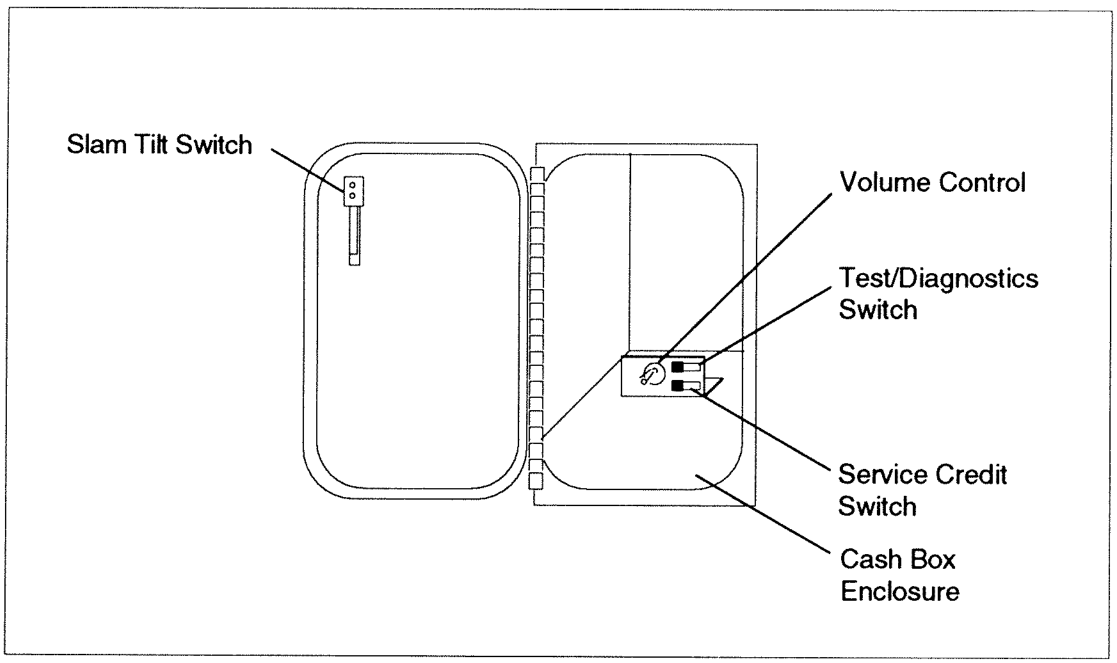
CONTROL SWITCHES

- The **COIN DOOR SLAM TILT SWITCH** detects any forceful vibrations against the Coin Door. This eliminates pounding for free games.

- The **VOLUME CONTROL** allows increasing or decreasing the volume level of the game music and speech. For greater profits, set your games volume level at its maximum.

- The **TEST/DIAGNOSTICS SWITCH** allows you to activate the games Menu System. Move the Test Switch to access the Main Menu. To exit the Menu System, select EXIT TO GAME OVER from the Main Menu, then press any control panel button.

- The **SERVICE CREDIT SWITCH** is a special feature switch that allots credit without affecting the games bookkeeping total.



Control Switch Location

Menu System Operation

OPERATION
All TOTAL CARNAGE Game Audits, Adjustments, and Diagnostics are options of the Main Menu. Each option, in turn, has its own menu, listing several choices that you may act upon as desired.

Move the Test Switch (on the cashbox lid panel) to activate the Main Menu (shown below). Game adjustments, bookkeeping, and diagnostics are all accessible from this menu.

Move any joystick up or down to cycle through the menu options. Notice that the options are highlighted in sequence. Press any button to activate a highlighted option.

Note: Only highlighted options can be activated.

SELECT WITH ANY STICK
ACTIVATE WITH ANY BUTTON

DIAGNOSTIC TESTS

COIN BOOKKEEPING

GAME AUDITS

GAME ADJUSTMENT

UTILITIES

EXIT TO GAME OVER

Main Test Menu

DIAGNOSTIC TESTS

To enter the Diagnostic Tests from the Main Menu, move any joystick to select (highlight) the Diagnostic Test option, and press any control panel button to activate the option.

SELECT WITH ANY STICK
ACTIVATE WITH ANY BUTTON

SWITCH TEST

DIP SWITCH TEST

CPU BOARD TEST

SOUND BOARD TEST

MONITOR PATTERNS

RUN BURN-IN TEST

RETURN TO MAIN MENU

Diagnostic Test Menu

Switch Test

The Switch Test allows the operator to test the switches on the control panel and the coin door.

Select the Switch Test by using any joystick to highlight the Switch Test option; then, press any control panel button to activate it. The top of the screen shows a layout of the control panel and the bottom of the screen lists the coin door switches. Pressing a switch causes the corresponding switch location on the screen to light. Release the switch and the screen returns to normal.

Press the Player 1 & 2 Start Buttons together to return to the Diagnostic Menu.

DIP SWITCH TEST

The DIP Switch Test allows the operator to check the position of the two 8-position DIP switches on the CPU Board. The operator can also change the setting of each position of each DIP Switch during this mode.

Use any joystick to select the DIP Switch Test and any control panel button to activate it. The screen displays a layout of their current settings.

To change a DIP Switch setting, press the switch to the desired setting, then check the screen to verify that the switch now shows the new setting.

Press any control panel button to return to the Diagnostic Menu.

NOTE: Switch positions SW3 through SW8 of Dip Switch DS1 determine the coinage of the game. To change the coinage setting, change the setting of Switch Positions SW3-SW8 to the desired setting shown in the DS1 Chart. The game must then go through a **FULL FACTORY RESTORE** (found in the Utilities Menu) to activate the change in coinage.

DS1

COUNTRY	COIN MODE	SW3	SW4	SW5	SW6	SW7	SW8
USA 1	L=1/.25 R=1/.25 1 Credit to start, 1 credit to continue	OFF	OFF	OFF	OFF	OFF	OFF
USA 2	L=1/.25 R=1/.25 2 Credits to start, 1 credit to continue	OFF	OFF	OFF	OFF	OFF	ON
USA 3	L, R=1/2X.25; 2/3X.25, 3/4X.25	OFF	OFF	OFF	OFF	ON	OFF
GERMANY 1	L=1/1DM, R=6/5DM, (3)=2/2DM	OFF	OFF	OFF	OFF	ON	ON
GERMANY 2	L=1/1DM, R=7/5DM, (3)=2/2DM	OFF	ON	OFF	ON	OFF	OFF
GERMANY 3	L=6/5DM, R=2/2DM, (3)=1/1DM	OFF	OFF	OFF	ON	OFF	ON
FRENCH 1	L=2/5F, R=5/10F	OFF	OFF	OFF	ON	ON	OFF
FRENCH 2	L=2/5F, R=4/10F	OFF	OFF	OFF	ON	ON	ON
FRENCH 3	L=1/3X1F, R=2/5F, (3)=5/10F	OFF	OFF	ON	OFF	OFF	OFF
SWISS 1	L=1/1F, R=6/5F	OFF	OFF	ON	OFF	OFF	ON
ITALY	L, R=1/500 LIRE	OFF	OFF	ON	OFF	ON	OFF
UK 1	L=1/20P, R=3/50P	OFF	OFF	ON	OFF	ON	ON
UK 2	L=2/20P, R=5/50P	OFF	OFF	ON	ON	OFF	OFF
UK ELEC.	L=4/L1.00, R=2/50P, (3)=1/30P, (4)=1/3X10P	OFF	OFF	ON	ON	OFF	ON
SPAIN 1	L=1/25 PESETA, R=5/100 PESETA	OFF	OFF	ON	ON	ON	OFF
AUSTRALIA 1	L=1/3X.20, R=2/1.00	OFF	OFF	ON	ON	ON	ON
JAPAN 1	L, R, (3)=1/100 YEN	OFF	ON	OFF	OFF	OFF	OFF
JAPAN 2	L, R, (3)=2/100 YEN	OFF	ON	OFF	OFF	OFF	ON
AUSTRIA 1	L=1/2X5 SCHILLING, R=3/2X10 SCHILLING	OFF	ON	OFF	OFF	ON	OFF
BELGIUM 1	L=7/50F, R=3/20F, (3)=1/2X5F	OFF	ON	OFF	OFF	ON	ON
BELGIUM 2	L=3/20F, R=3/20F	OFF	ON	OFF	ON	OFF	OFF
SWEDEN	L=1/3X1 KRONA, R=2/5 KRONA	OFF	ON	OFF	ON	OFF	ON
NEW ZEALAND	L, R=1/3X.20	OFF	ON	OFF	ON	ON	OFF
NETHERLANDS	L=1/1HFL, R=3/2.5HFL	OFF	ON	OFF	ON	ON	ON
FINLAND	L=1/2X1 MARKKA, 3/5X1 MARKKA	OFF	ON	ON	OFF	OFF	OFF
NORWAY	L=1/2X1 KRONE, R=3/5X1 KRONE	OFF	ON	ON	OFF	OFF	ON
DENMARK	L=1/2X1 KRONE, R=3/5X1 KRONE,	OFF	ON	ON	OFF	ON	OFF
	7/2X5 KRONE	ON	ON	ON	ON	ON	ON

CPU Board Test
The CPU Board Test (much like the Start-up Test) allows the operator to check the RAMs and ROMs.

Select the CPU Board Test with any joystick; then, press any control panel button to activate the automatic test of the CPU Board's RAMs and ROMs. When this test is activated, a "rug" pattern appears on the screen. The screen then changes to show the layout of the RAMs and ROMs on the CPU. Any chip that is shown as black with a white outline is part of the CPU and should turn either red or green during the CPU Test. Any chip that is shown as gray with a white outline is not installed in the game. During the test, chips are good, if they turn green; they are faulty, if they turn red.

Sound Board Test
The Sound Test allows listening to some of the sounds that TOTAL CARNAGE is capable of producing. This test also emits a tone for each fault that is detected. After completion of this test, the main menu will be automatically returned to the veiwing screen.

Monitor Patterns
The Monitor Patterns Test provides a menu for testing the monitor. Select the test with any joystick and activate with any control panel button. Once the Monitor Test is activated, move any joystick to select a Monitor Test option; press any control panel button to activate the option.

SELECT WITH ANY STICK
ACTIVATE WITH ANY BUTTON

RED SCREEN

GREEN SCREEN

BLUE SCREEN

COLOR BARS

CROSSHATCH PATTERNS

BACK TO DIAGNOSTICS MENU

RETURN TO MAIN MENU

Monitor Pattern Menu

The **RED, GREEN,** and **BLUE SCREEN** tests fill the screen with either red, green or blue.
The **COLOR BARS** test fills the screen with several gradated colors to help with red, green and blue level adjustments Each color should appear sharp and clear.
The **CROSSHATCH PATTERNS** test fills the screen with a grid and a series of dots. The grid and the dots should be clear. The dots should appear round.

If any of the Monitor Pattern Tests shows a need for adjustment, use the proper white knobs on the Monitor Board.

Use any joystick to select RETURN TO MAIN MENU or BACK TO DIAGNOSTIC MENU and activate with any control panel button.

Run Burn-in Test
The Burn-in Test continually repeats the CPU Board Test. Move any joystick to select the Burn-in Test; then, press any control panel button to activate the test. When the Burn-in Test detects an error, the test stops and displays an error message on the screen. Use this test to find intermittent CPU problems.

To exit this test, switch the game OFF then ON again.

COIN BOOKKEEPING

To enter Coin Bookkeeping from the Main Menu, move any joystick to select the Coin Bookkeeping option; then, press any control panel button to activate it.

The Coin Bookkeeping Table records the coinbox totals and game play counters. The left side of the table names the bookkeeping item; the right side shows the number of coins, credits or plays for each item.

To exit Coin Bookkeeping, move any joystick to select RETURN TO MAIN MENU; then, press any control panel button to activate it.

LEFT SLOT COINS	0
RIGHT SLOT COINS	0
ATTRACT MODE STARTS	0
MID GAME STARTS	0
GAMES CONTINUED	0
PAID CREDITS	0
TOTAL COLLECTION	$0.00
SERVICE CREDITS	0
TOTAL PLAYS	0
PLAYS UNTIL HIGH SCORE RESET	5000
CLEAR COIN COUNTERS	
RETURN TO MAIN MENU	

Coin Bookkeeping Table

GAME AUDITS

To enter Game Audits from the Main Menu, move any joystick to select the Game Audits option; then, press any control panel button to activate it. To advance to the next (or return to the previous) page of the Game Audit Table, move any joystick to select either "Next Audit Page" or "Previous Audit Page"; then, press any control panel button to change the page.

The Game Audits Table records the game play statistics. The left side of the table names the Audit item; the right side shows the amount of play.

ATTRACT MODE STARTS	0
MID GAME STARTS	0
GAMES CONTINUED	0
EXTRA MEN COLLECTED/EARNED	0
HOURS OF SINGLE PLAY	0:00
HOURS OF DUAL PLAY	0:00
TOTAL HOURS OF PLAY	0:00
AVG. "PLAYER" GAME TIME (MIN.)	0:00
AVE. ELAPSED TIME/PLAY	0:00
PASSWORD WARPS STEPPED ON	0
PASSWORD WARPS SUCCESSFUL	0
WARPS APPEARED	0
WARPS TAKEN	0
WARPS COMPLETED	0
PLACED IN ELECTRIC CHAIR	0
SURVIVED ELECTRIC CHAIR	0

NEXT AUDIT PAGE
RETURN TO MAIN MENU

Page 1 of Audit Table

TOTAL DEATHS	0
ATTRACT MODE STARTS	0
REACHED TAUNT 1	0
REACHED ORCUS	0
STARTS /CONTINUES DURING ORCUS	0
REACHED ROAD 1	0
STARTS /CONTINUES DURING ROAD 1	0
REACHED AIRPORT	0
REACHED ROAD 2	0
REACHED REACTOR	0
REACHED LAST BOSS	0
REACHED PLEASURE DOME	0
NUMBER OF FULL GAMES	0
AVERAGE # KEYS COLLECTED	0
ENTERED PLEASURE DOME/FINISHED GAME	0
LOCKUPS	0

PRIVIOUS AUDIT PAGE
RETURN TO MAIN MENU

Page 2 of Audit Table

To exit the Game Audit Table, move any joystick to select RETURN TO MAIN MENU; then, press any control panel button to activate your selection.

GAME ADJUSTMENTS

NOTE: Game Adjustments are explained in more detail on the following page.

Move any joystick to select the Game Adjustment option on the Main Menu; then, press any control panel button to activate it.

The Game Adjustments option allows the owner/operator to change the Game Pricing and Game Difficulty.

The Game Adjustments Menu offer several options. Each option has its own menu. Move any joystick to select an option; then, press any control panel button to activate that option. On the next menu screen, move any joystick to select the item you wish to modify; then, press any control panel button to activate that item. The activated item provides a setting choice. Move any joystick to change the current setting value; then, press any control panel button to lock in the new setting value. Moving the joystick up increases the setting value, moving the joystick down decreases the setting value.

SELECT WITH ANY STICK
PRESS A BUTTON TO MODIFY

RETURN TO MAIN MENU

STANDARD PRICING

CUSTOM PRICING

COIN COUNTER MODE

GAME DIFFICULTY

LIVES PER PLAY

ATTRACT-MODE SOUND

AUTO HIGH SCORE RESET

VIOLENCE LEVEL

RETURN TO MAIN MENU

Game Adjustment Menu

To exit the Adjustments Menu, use any joystick to select RETURN TO MAIN MENU; then, use any control panel button to activate your selection.

Standard Pricing
Standard Pricing allows the operator to choose any of the "Standard" selections for the Standard Pricing Table.

Custom Pricing
Custom Pricing allows the operator to install pricing other than that of the Standard Pricing Table. Custom Pricing also allows the operator to select the amount of credits required to start a game and the amount of credits required to continue a game. This option is adjusted from the Dip Switch Settings.

Coin Counter Mode
This controls the mechanical coin counter mode.

Game Difficulty
Game Difficulty allows the operator to select the difficulty level of the game. The settings for the adjustment are:

-Easiest Setting: 1
-Hardest Setting: 10
-Factory Setting: 3

Lives Per Play
This option allows the operator to set the number of Lives a player receives each time he starts or continues a game. ***NOTE:*** *If game is set to 2 credits to start, 4 lives are awarded, and 3 lives are awarded for continue.*

-Factory Setting: 3 Lives

Attract-Mode Sounds
Determines whether the game will make sounds in the attract mode. The settings for the adjustment are:

-On (factory)
-Off

Auto High Score Reset
The all time High Score Table will be reset to factory values each time this many plays occurs.

-Factory Setting: 5000

Violence Level
This allows the graphic violence shown on the screen to be adjusted.

-Factory Setting: Normal

Standard Pricing Table

NAME	SETTING Credit/Coin	LEFT CHUTE	CENTER CHUTE	RIGHT CHUTE	FOURTH CHUTE
USA 1	1/25¢ 1Credit to Start, 1 Credit to Continue	25¢		25¢	
USA 2	1/25¢ 2 Credits to Start, 1 Credit to Continue	25¢		25¢	
USA 3	1/50¢, 3/$1.00	25¢		25¢	
USA 4	1/50¢, 4/$1.00	25¢		25¢	
USA 5	1/25¢, 4/$1.00	25¢	$1.00	25¢	
USA 6	1/50¢, 2/$1.00	25¢	$1.00	25¢	
USA 7	1/50¢, 3/$1.00	25¢	$1.00	25¢	
USA 8	1/50¢, 4/$1.00	25¢	$1.00	25¢	
USA ECA	1/25¢, 4/$1.00	$1.00	10¢	25¢	5¢
German 1	1/1DM, 6/5DM	1DM		5DM	
German 2	1/1DM, 7/5DM	1DM		5DM	
German 3	1/1DM, 8/5DM	1DM		5DM	
German 4	1/1DM, 5/5DM	1DM		5DM	
German ECA	1/1DM, 2/2DM, 6/5DM	5DM	1DM	2DM	
France 1	2/5F, 5/10F	5F		10F	
France 2	2/5F, 4/10F	5F		10F	
France 3	1/5F, 3/10F	5F		10F	
France 4	1/5F, 2/10F	5F		10F	
France 5	2/5F, 5/10F, 11/2 x 10F	5F		10F	
France 6	2/5F, 4/10F, 9/2 x 10F	5F		10F	
France 7	1/5F, 3/10F, 7/2 x 10F	5F		10F	
France 8	1/5F, 2/10F, 5/2 x 10F	5F		10F	
France 9	1/3 x 1F, 2/5F	1F		5F	
France 10	1/2 x 1F, 3/5F	1F		5F	
France 11	1/3 x 1F, 2/5F, 5/2 x 5F	1F		5F	
France 12	1/2 x 1F, 3/5F, 7/2 x 5F	1F		5F	
France ECA	1/3 X 1F, 2/5F, 5/2 x 5F	1F	10F	5F	10 P
Canada	1/2 x 25¢, 3/$1.00	25¢		$1.00	
Swiss 1	1/1F, 6/5F	1F		5F	
Swiss 2	1/1F, 7/5F	1F		5F	
Swiss 3	1/1F, 3/5F	1F		5F	
Italy	1/500 Lire	500 Lire		500 Lire	
UK 1	1/20P, 3/50P	20P		50P	
UK 2	2/20P, 5/50P	20P		50P	
UK ECA	1/30P, 2/50P, 4/£1.00	£1.00	20P	50P	
UK w/CCU	1/30P, 2/50P, 4/£1.00	CCU			
Spain 1	1/25 Peseta, 5/100 Peseta	25 Peseta		100 Peseta	
Spain 2	1/25 Peseta, 4/100 Peseta	25 Peseta		100 Peseta	
Australia 1	1/3 x 20¢, 2/$1.00	20¢		$1.00	
Australia 2	1/5 x 20¢, 1/$1.00, 3/$2.00	20¢		$1.00	
Japan 1	1/100 Yen	100 Yen		100 Yen	
Japan 2	2/100 Yen	100 Yen		100 Yen	
Austria 1	1/5Sch, 2/10Sch	5Sch		10Sch	
Austria 2	1/2 x 5Sch, 3/2 x 10Sch	5Sch		10Sch	
Belgium 1	1/20F	20F		20F	
Belgium 2	3/20F	20F		20F	
Belgium 3	2/20F	20F		20F	
Belgium ECA	1/25F, 4/100F	50F	5F	20F	
Sweden	1/3 x 1Kr, 2/5Kr	1Kr		5Kr	
New Zealand 1	1/3 x 20¢	20¢		20¢	
New Zealand 2	1/2 x 20¢	20¢		20¢	
Netherlands	1/1Hfi, 3/2.5Hfi	1Hfi		2.5Hfi	
Finland	1/1Mka	1Mka		1Mka	
Norway	1/2 x 1Kr, 3/5 x 1Kr	1Kr		1Kr	
Denmark	1/2 x 1Kr, 3/5Kr, 7/2 x 5Kr	1Kr		5Kr	
Antilles	1/25¢, 4/1 Guilder	25¢		1 Guilder	

If option desired is not shown above, use custom pricing .

Custom Pricing

SELECT WITH ANY STICK
PRESS A BUTTON TO MODIFY

RETURN TO ADJUSTMENTS MENU

(1) LEFT CHUTE (1) UNITS

(1) RIGHT CHUTE (2) UNITS

(1) CHUTE (3) UNITS

(1) CHUTE (4) UNITS

(2) UNITS/CREDIT

(3) UNITS/BONUS

(4) MINIMUM UNITS REQUIRED

(5) CREDITS TO START

(6) CREDITS TO CONTINUE

(7) COIN PAGE HELP

(8) SHOW CREDIT FRACTIONS

(9) COINS PER DOLLAR

(10) FREE PLAY

(11) MAXIMUM CREDITS

(1) Coins inserted accumulate units. This adjustment specifies the number of units given for each coin in the fourth chute (see "units/credit")
(2) This is the number of coin units required to buy one credit.
(3) One bonus credit is awarded after this many coin units have accumulated.
(4) No credits will be awarded until this many coin units have accumulated.
(5) Each player needs this many credits to begin a game.
(6) Each player needs this many credits to continue a game.
(7) Whenever standard pricing is used, a corresponding message is displayed on the credits screen. Setting this to no disables the message.
(8) When set to yes, fractional credits will be seen on the credits screen.
(9) The detailed bookkeeping screen shows total collections based on this many coins per dollar. (Set to zero to disable the display of money totals.)
(10) Setting Free Play to "Yes" allows unlimited play without inserting any coins. Factory setting is No.
(11) This is the limit for the credits counter. Additional coins inserted will be lost. Factory setting is 30.

UTILITIES

Move any joystick to select the Utilities option on the Main Menu; then, press any control panel button to activate it.

The Utilities Menu allows the owner/operator to clear the games bookkeeping memory and to install a custom message.

SELECT WITH ANY STICK
ACTIVATE WITH ANY BUTTON

CLEAR CREDITS

CLEAR COIN COUNTERS

CLEAR GAME AUDITS

RESET HIGH SCORE

DEFAULT ADJUSTMENTS

FULL FACTORY RESTORE

RETURN TO MAIN MENU

Utilities Menu

Move any joystick to select an item from the Utilities Menu; then, press any control panel button to activate that item. After an item has been activated, you are given the option of resetting that item or not. For example:

CLEAR CREDITS?
ARE YOU SURE?

YES
NO

Move any joystick to choose YES or NO; then, press any control panel button to lock your choice and to return to the Utilities Menu.

To exit the Utilities Menu, move any joystick to select RETURN TO MAIN MENU; then, press any control panel button to activate your selection.

Troubleshooting

PROBLEM	POSSIBLE SOLUTION
NO PICTURE OR DISTORTED PICTURE.	Check for faulty video board or monitor. Check for disconnected video signal cable.
TURN GAME ON & NOTHING HAPPENS.	Check line fuse. Check for +5Vdc at pins C, D, 3, and 4 of the JAMMA Connector.
NO SOUND.	Check the speaker and speaker connection to pins L and 10 on the JAMMA Connector. Check volume control setting. Check for +12Vdc at pins F and 6 on the JAMMA Connector. Check interboard wiring from CPU Board to the Sound Board.
NO GENERAL ILLUMINATION.	Check the 1A., S.B. fuse on the floor, left of the front slide out door.
MOVE JOYSTICK, BUT PLAYER DOES NOT MOVE.	Check for open wires between the Joystick and CPU Board. Check for contamination on joystick switch contacts and CPU Board pins. Check for proper ground.
PRESS START BUTTON AND NOTHING HAPPENS.	Check for open wires between the button and CPU Board. Check for contamination on CPU Board pins or the button switch blade contacts. Check for proper ground.
NO CREDIT GIVEN WHEN COINS ARE INSERTED.	Check for contamination on coin switch contacts. Check for an open wire between Coin Switch 1 and pin 16 on the JAMMA Connector or Coin Switch 2 and pin T of the JAMMA Connector.
TOO MANY CREDITS FOR NUMBER OF COINS INSERTED.	Check Game Pricing setting. Check for a Short between pins T & 16 on the JAMMA Connector.
GAME STAYS IN THE TEST MODE.	Check that the Test Switch in the coin door and the Test Switch (Position 8) on DIP Switch 2 are set to Off.

NOTES

TOTAL CARNAGE

SECTION
TWO

Parts Information

Cabinet Hardware

Cabinet Assembly	A-14638-40010
Wheel Bracket	01-9359
Caster Wheel	20-9627
Caster Shaft	02-4404
Leg Leveler Plate	01-9155
Leg Adjuster, 3.0"	08-7377
Front Door Assembly	A-14267
Latch Bracket	01-6994
Bezel & Instruction Card Set	A-14374-2
25" CRT Bezel	03-8497
Instruction Card	31-1606-40010
Coin Door Assembly	A-14975
Test Switch	A-13115
Coin Door Cable	H-14923
Coin Door, U.S.A.	09-20000-V-1
Line Voltage Cable Assembly	A-14201
Glass Retainer Bracket	01-9607
20" Vent Hole Cover	03-7602
Marquee Retainer	03-8252-2
Plastic Pull Vent	03-8326
Lamp Lock	03-8327
Glass Edge Channel	03-8358
Clear Glass	08-7456-10
Rear Door	11-1014
TAG Special Wrench	16-9074
Toggle Latch	20-9347
Long Arm Key	20-9620
Long Arm Key	20-9680
#555 Bulb, 6.3V	24-8768
Marquee	31-1644-40010
Fuse 1 Amp, S.B. 250V	5731-06569-00
Fuse 3 Amp, S.B. 250V	5731-10356-00

Speakers

Speaker Panel Assembly	A-15276
Speaker Cable	H-14202
Piezo Speaker Cable	H-14922
Speaker Grille	31-1651
6" Speaker, 25W, 4 Ohm	5555-12929-00
4" Speaker, 15W, 4 Ohm	5555-12924-00

Manuals

Monitor Manual	16-3000-103
Instruction Manual	16-40010-101

PC Boards

Chassis Panel Assembly	A-14157-2
Power Supply Switcher Assy.	A-15202
Sound Board Assembly	A-14732-40010
Y-Unit CPU Assembly	A-13234-40010
Sound Power Speaker Cable	H-14925
Main Harness Cable	H-15092

Transformer Assembly

Power Pack Assembly	D-13252
Line Cord Assembly	A-13340
Power Transformer	A-13771
Power Pack Chassis Assy.	C-13251
Power Pack Jumper Cable	H-13265
Line Filter Jumper Cable	H-13344
Transformer Jumper Cable	H-13378
Varistor, 130V, 10J	5017-09044-00
Line Filter, 5 Amp	5102-08895-00
Fuse, SB, 3A, 250V	5731-10356-00
Fuse Holder, Panel	5733-10358-00
20 Pin Ribbon Cable	5795-10937-06

Florescent Lamp Parts

Florescent Housing & Bracket	C-12679
Housing Mounting Brkt.	01-9146
Light Fixture	20-9590
18" Fluorescent Bulb, 15W	24-8809

Monitor

25" Monitor	5675-12787-00

Control Panel

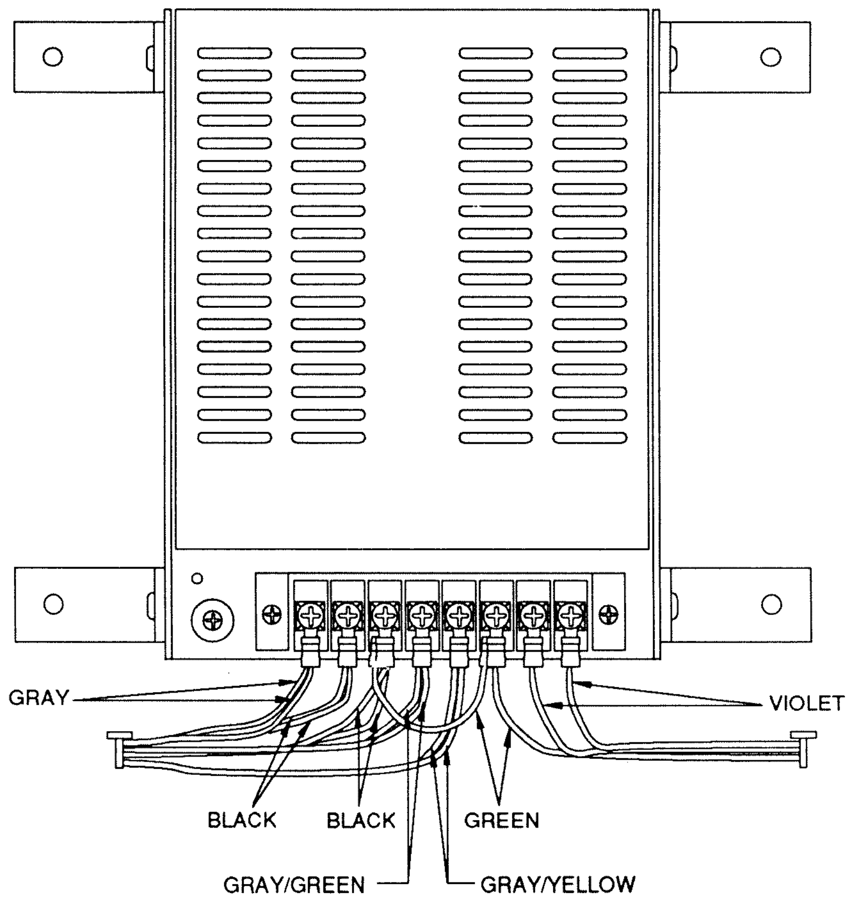
Housing & Control Panel Assembly	A-15504
Control Panel Assembly	A-15505
Wood Control Panel	11-1071
Screened Overlay	31-1680-40010
Latch Bracket	01-6994
Control Panel Bracket	01-9651
Latch Bracket	01-9605
Red Pushbutton	20-9687-1
8-Way Red Joystick	20-9694-1
Control Panel Cable	H-15093
Control Plate Assy.	A-15503
Wood Housing	11-984-40110
Toggle Latch	20-9347
3/16" T-Molding (Red)	RM-25-03

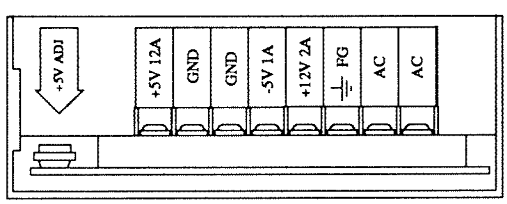
Cables

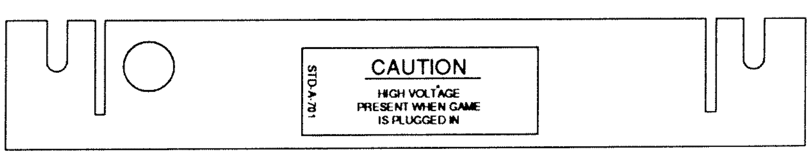
Video Extension Cable	H-14924
General Illumination Cable	H-14926

A-15202
Power Supply Switcher Assembly

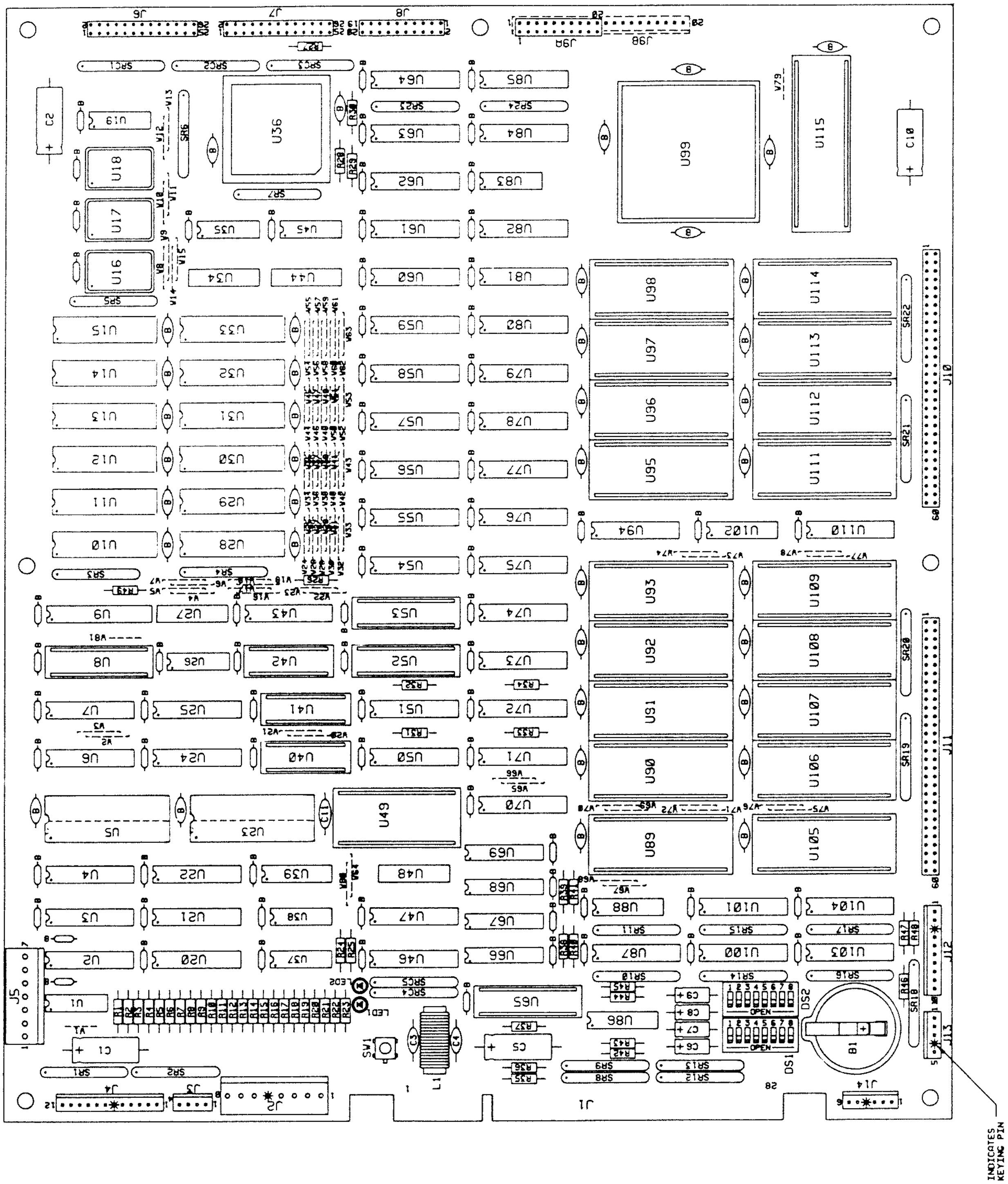
Part Number	Description
H-15203	Switch/Power Cable
01-10573	Shield
20-9700	Power Supply
16-8587-701	High Voltage Cable
H-15206	Ground Jumper Cable
01-10500	Mounting Bracket







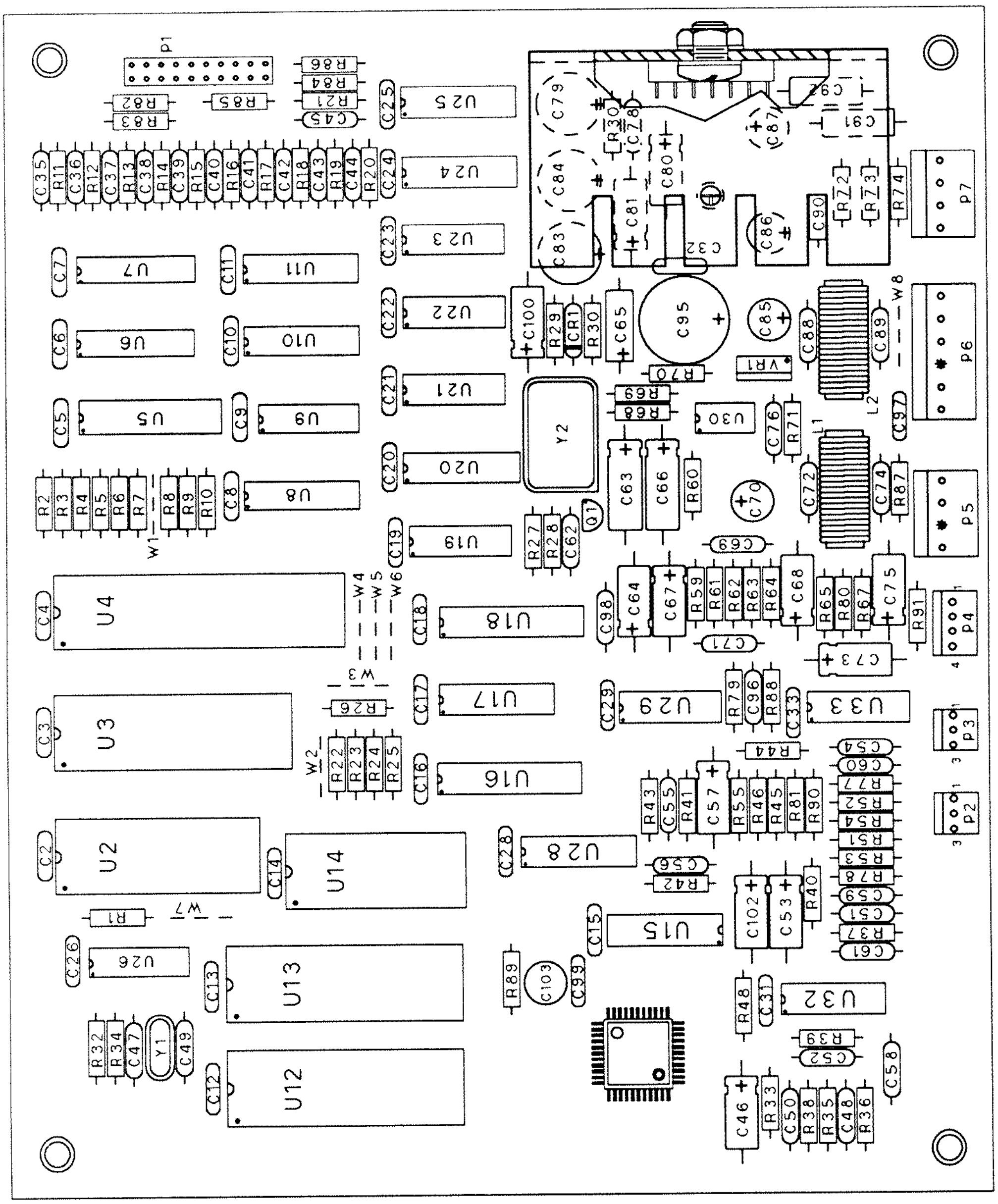
A-13234-40010
CPU Board Assembly



A-13234-40010
CPU Board Parts

Part Number	Part Designator	Description	Part Number	Part Designator	Description
		*Bare PC Board	5019-12611-00	SR1, SR3, SR8, SR9, SR12, SR13, SR18	SIP, 470Ω 5 Res.
5281-09737-00	U1	IC, 74LS86	5019-09362-00	SR3, SR4, SR6, SR7, SR11, SR15, SR17, SR19, SR20, SR21, SR22, SR23, SR24, SRC1, SRC2, SRC3	SIP, 4.7KΩ
5317-12211-00	U2, U20, U24, U43, U61, U62, U70	IC, 74ALS541	5019-10143-00	SR5	SIP, 470Ω 9 Res.
5317-12212-00	U3, U6, U7, U21, U25, U50, U58, U63, U64, U71, U72, U74, U79, U84, U85	IC, 74ALS574	5060-10396-00	SRC4, SRC5, SRC10, SRC14, SRC16	SIP, 4.7KΩ 470pf
5317-12208-00	U4, U22, U54-U57, U59, U60, U75-U78, U80, U81, U94, U110	IC, 74ALS245	5671-09019-00	LED1, LED2	LED, Red
5340-12840-00	U5, U23	IC, 8K X 8 S RAM	5551-09822-00	L1	Inductor, 4.7UH
5700-12047-00	U8, U52, U53, U65	24 Pin Socket	5645-09025-00	DS1, DS2	DIP Sw. 16 Pin
5340-12213-00	U10-U15, U28-U33	IC, 4461 VRAM	5641-12551-00	SW1	Pushbutton Sw.
5521-10421-00	U16	48 MHZ Xtal	5881-12315-00	B1	Battery Holder
5521-10318-00	U17	24 MHZ Xtal	5791-10862-08	J2	8 Pin Connector
5283-10468-00	U19, U45	IC, 74f74	5791-12461-12	J4	12 Pin Connector
5019-10849-00	U27, U34, U44, U48	100Ω DIP Res.	5791-10850-00	J6, J7	26 Pin Ribbon Conn
5286-13209-00	U35	IC, 74AS00	5791-09437-00	J8	20 Pin Ribbon Conn
5700-12253-00	U36	68 Pin Socket	5791-12461-10	J12	10 Pin Connector
5280-09309-00	U37	IC, 7407	5700-12252-00	U12, U15	24 Pin Socket
5281-09487-00	U38	IC, 74LS74	5791-12461-05	J13	50 Pin Connector
5434-12255-00	U39	MAX691	5410-12239-00	U99	CPU Sub-assembly
5700-09915-00	U40, U41, U42	20 Pin Socket	5791-12461-20	J9A, J9B	IC, PLD Color RAM
5311-12287-00	U46, U47, U87, U100, U101, U103, U104	IC, 74HC541	5791-12461-04	J3	IC, TMS34010-50
5700-10176-00	U49	28 Pin Socket	5791-12461-05	J1B	IC, PLD Address Decoder
5311-12285-00	U51, U73, U82	IC< 74HC573	A-5346-40010-1	U8	IC, PLD Color RAM
5340-12014-00	U66-U69	IC, 4464 DRAM	5400-12220-00	U36	IC, TMS34010-50
5283-10552-00	U83	IC, 74F04	A-5346-40010-2	U40	IC, PLD Address Decoder
5370-12602-00	U86	IC, ULN2064B	A-5346-40010-3	U41	IC, PLD C, PLD Video RAM
5317-12023-00	U88	IC, 74ALS138	A-5346-40010-4	U42	IC, PLD Local Control
5700-12088-00	U89-U93, U95-U98, U105-U109, U111-U114	32 Pin Socket	5340-12558-00	U49	IC, 8Kx* Static RAM 150nx
5700-12254-00	U99	144 Pin Socket	A-5346-40010-5	U52	IC, PLD Video RAM Sequencer
5317-12024-00	U102	IC, 74ALS139	A-5346-40010-6	U53	IC, PLD Image ROM
5700-08985-00	U115	40 Pin Socket	A-5346-40010-7	U65	IC, PLD Miscellaneous
5010-08991-00	R1, R24, R27	Res. 4.7KΩ 5% 1/4W	A-5343-40010-1	U89	IC, Game EPROM
5010-10204-00	R2, R7, R12	Res. 1KΩ 2% 1/4W	A-5343-40010-2	U90	IC, Game EPROM
5010-10205-00	R3, R8, R13	Res. 2KΩ 2% 1/4W	A-5343-40010-3	U91	IC, Game EPROM
5010-10000-00	R4, R9, R14	Res. 3.9KΩ 5% 1/4W	A-5343-40010-4	U92	IC, Game EPROM
5010-09219-00	R5, R10, R15	Res. 8.2KΩ 5% 1/4W	A-5343-40010-5	U93	IC, Game EPROM
5010-08772-00	R6, R11, R16	Res. 15KΩ 5% 1/4W	A-5343-40010-6	U95	IC, Game EPROM
5010-09001-00	R23, R25	Res. 330Ω 5% 1/4W	A-5343-40010-7	U96	IC, Game EPROM
5010-09036-00	R26, R29-R34, R50, R51	Res. 100Ω 5% 1/4W	A-5343-40010-8	U97	IC, Game EPROM
5010-09416-00	R35-R37, R46-R48	Res. 470Ω 5% 1/4W	A-5343-40010-9	U98	IC, Game EPROM
5010-08997-00	R38-R45	Res. 2.7Ω 5% 1/4W	5410-12239-00	U99	IC, Custom ASIC
5010-09534-00	W2, W8, W11, W12, W14, W21, W22, W24, W27, W29, W31, W32, W34, W36, W39, W41, W42, W45, W47, W48, W50, W52, W55, W57, W58, W60, W62, W66, W68, W69, W71, W73, W75, W77, W80	Res. 0Ω	A-5343-40010-10	U105	IC, Game EPROM
5043-08980-00	B	Cap. .01ufd 10V	A-5343-40010-11	U106	IC, Game EPROM
5040-08986-00	C1, C2, C5, C10	Cap. 100ufd 10V	A-5343-40010-12	U107	IC, Game EPROM
5043-09845-00	C3, C4	Cap. .001ufd 10V	A-5343-40010-13	U108	IC, Game EPROM
5041-09243-00	C6-C9	Cap. 10ufd 10V	A-5343-40010-14	U109	IC, Game EPROM
5043-08996-00	C11	Cap. .1 ufd	A-5343-40010-15	U111	IC, Game EPROM
			A-5343-40010-16	U112	IC, Game EPROM
			A-5343-40010-17	U113	IC, Game EPROM
			A-5343-40010-18	U114	IC, Game EPROM
			A-5346-40010-8	U115	IC, PLD Autoerase
			5880-11056-00	B1	Battery, Lithium 3V
			03-8338-1		1/4" Spacer
			5340-12213-00	U12-U15	IC< 4461 VRAM, 64Kx5 150ns

A-14732-40010
Sound Board Assembly



A-14732-40010
Sound Board Parts

Part Number	Part Designator	Description
5340-12958-00	U7, U11, U24	IC, 26LS31
5340-12959-00	U6, U10, U25	IC, 26LS32
5281-09850-00	U19	IC, 74LS11
5281-09215-00	U26	IC, 74LS04
5281-09851-00	U21	IC, 74LS14
5281-09487-00	U9, U22, U23	IC, 74LS74
5281-09745-00	U8	IC, 74LS138
5281-09246-00	U20	IC, 74LS139
5281-09733-00	U17	IC, 74LS174
5281-09486-00	U5, U16	IC, 74LS374
5340-12278-00	U2	IC, Static RAM
5370-12260-00	U30	IC, 3340 Attenuator
5460-12743-00	VR1	IC, 7809 Regulator
5370-12960-00	U29	IC, LM324 OP Amp
5370-12730-00	U32, U33	IC, TL084 OP Amp
5371-12727-00	U15	AD7524 DAC
5370-12963-00	U31	HA13116 Pwr. Amp.
5521-10931-00	Y2	8Mhz Oscillator
5520-09020-00	Y1	3.58Mhz Crystal
5010-09534-00	W2, W3, W5, W7, W8	0Ω Resistor
5010-12961-00	R72-R74	3.3Ω Res., 5%, 1/2W
5010-09039-00	R89	10Ω Res., 5%, 1/4W
5010-10170-00	R11-R21	47Ω Res., 5%, 1/4W
5010-09036-00	R4, R30, R90	100Ω Res., 5%, 1/4W
5010-09187-00	R27	150Ω Res., 5%, 1/4W
5010-09160-00	R83	220Ω Res., 5%, 1/4W
5010-09416-00	R32, R43, R41, R82	470Ω Res., 5%, 1/4W
5010-09358-00	R43, R68	1KΩ Res., 5%, 1/4W
5010-08998-00	R22-R24, R26, R59, R61	2.2KΩ Res., 5%, 1/4W
5010-08983-00	R28	3.3KΩ Res., 5%, 1/4W
5010-10000-00	R87	3.9KΩ Res., 5%, 1/4W
5010-08991-00	R1-R3, R5-R10, R25, R84-R86, R91	4.7KΩ Res., 5%, 1/4W
5010-09219-00	R69	8.2KΩ Res., 5%, 1/4W
5010-09034-00	R62, R63, R67, R70, R80	10KΩ Res., 5%, 1/4W
5010-09269-00	R64	12KΩ Res., 5%, 1/4W
5010-09324-00	R58	27KΩ Res., 5%, 1/4W
5010-09325-00	R36	39KΩ Res., 5%, 1/4W
5010-09035-00	R29, R53, R81	47KΩ Res., 5%, 1/4W
5010-10987-00	R77, R78	56KΩ Res., 5%, 1/4W
5010-10650-00	R38, R45, R51	62KΩ Res., 5%, 1/4W
5010-08776-00	R31, R71	68KΩ Res., 5%, 1/4W
5010-10257-00	R35	75KΩ Res., 5%, 1/4W
5010-12927-00	R79	82KΩ Res., 5%, 1/4W
5010-09162-00	R33, R48, R54, R55, R60, R65	100KΩ Res., 5%1/4
5010-12965-00	R39	130KΩ Res., 5%, 1/4W
5010-09134-00	R40, R44, R46, R52	150KΩ Res., 5%, 1/4W
5010-12964-00	R37, R42	820KΩ Res., 5%, 1/4W
5048-11027-00	C59, C60	33pF Cap., 10%
5043-10264-00	C50, C62	68pF Cap., 10%
5043-09492-00	C35-C45, C47, C49, C98	100pF Cap., 10%
5048-12748-00	C54, C61, C96	220pF Cap., 10%
5048-11030-00	C71	470pF Cap., 10%
5048-12506-00	C78	820pF Cap., 10%
5048-11031-00	C48, C55, C76	1000pF Cap., 10%
5048-11065-00	C69	2200pF Cap., 10%
5048-12967-00	C58	2700pF Cap., 10%
5048-11072-00	C51, C56	3300pF Cap., 10%
5048-12966-00	C52	3900PFCap., 10%
5043-08980-00	C2-C26, C28, C29,C31-C33, C97, C99	.01mF Cap.
5045-12926-00	C90-C92	.1mF Cap., 10%
5043-08996-00	C72, C74, C88, C89	.1mF Cap., 20%
5048-12036-00	C65	.22mF Cap., 10%
5040-09365-00	C68	1mF, Cap.,
5040-09343-00	C46, C53, C57, C64, C67, C73, C75, C81C100, C102	10mF Cap., 16V, 20%
5040-09332-00	C63, C66, C80	47mF Cap., 25V
5040-09421-00	C70, C85-C87, C103	100mF Cap., 25V
5040-09506-00	C79, C83, C84	220mF Cap., 16V
5040-12670-00	C95	2200mF Cap., 16V
5070-08919-00	CR1	1N4148 Diode
5160-12891-00	Q1	MPS3646 Trans.
5551-09822-00	L1, L2	4.7μH Inductor, 3A
5700-09006-00	U28	16-pin Socket
5700-09915-00	U18	20-pin Socket
5700-09004-00	U14	24-pin Socket
5700-08985-00	U4	40-pin Socket
5700-12088-00	U3, U12, U13	32-pin Socket
5791-10862-04	P5, P7	4-pin Header
5791-10862-06	P6	6-pin Socket
5791-09437-00	P1	20-pin Header
01-10516	Heat Sink	
4406-01128-00	6-32 Hex Nut	
4006-01003-06	6-32 x 3/8 P-PH-S	
20-9690-18	Spacer, 1-1/8	
	*Bare PCB	
A-5343-40010-19	U3	IC, EPROM Assy
5400-10320-00	U4	IC, 68B09E MPU
A-5343-40010-20	U12	IC, EPROM Assy
A-5343-40010-21	U13	IC, EPROM Assy
5370-11086-00	U14	IC, YM2151 Sd Gen
A-5346-40010-9	U18	IC, PLD Sound
5371-11087-00	U28	IC, YM3012 DAC
03-8338-1	Mtg. Spacer 1/4"	

Notes: 1. See Section 3 For Schematic
2. * = Not for individual sale.

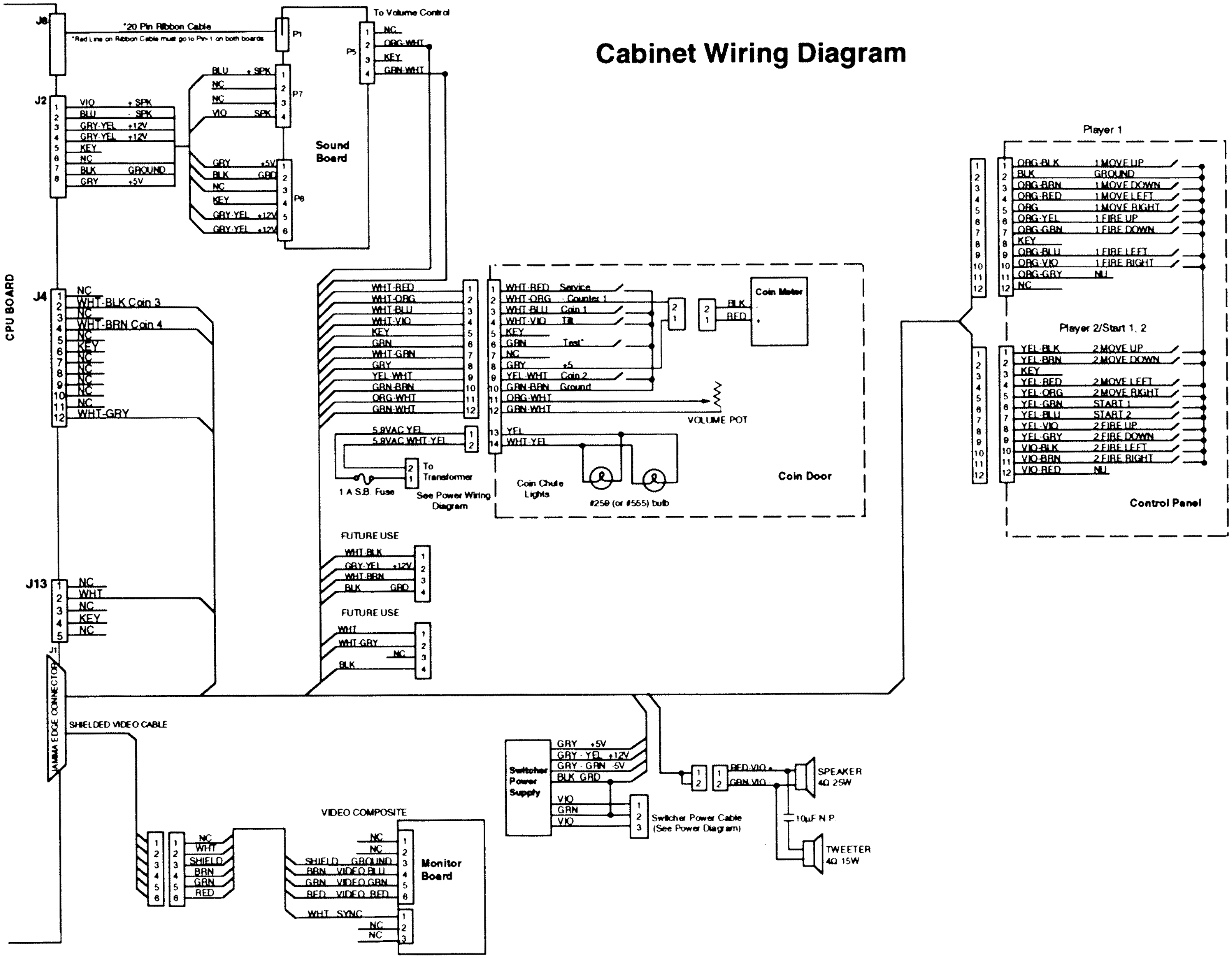
NOTES

TOTAL CARNAGE

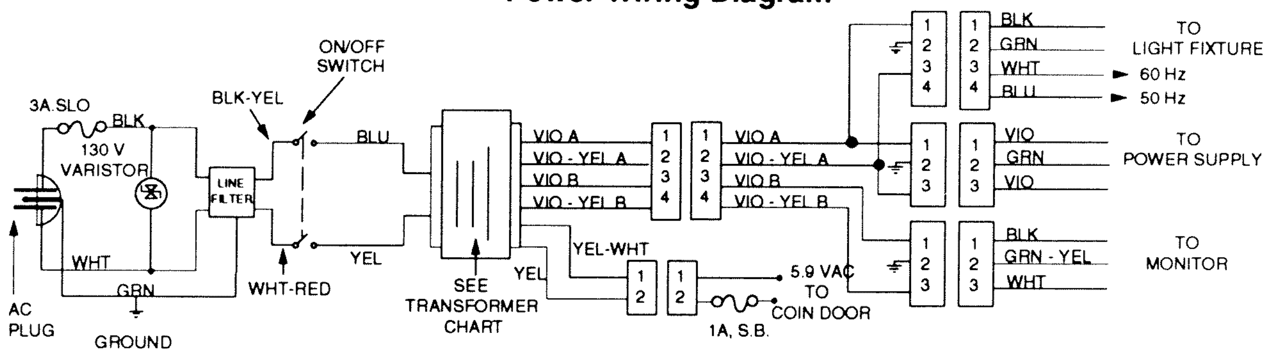
SECTION
THREE

Schematics & Diagrams

Cabinet Wiring Diagram

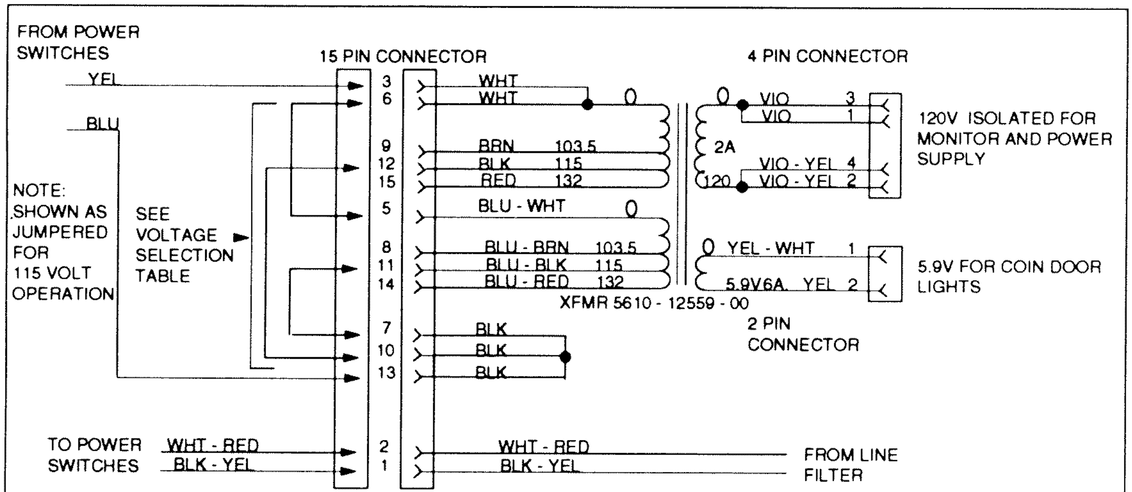


Power Wiring Diagram



Note
For 60HZ Operation, insert Vio-Yel wire into Pin 3.
For 50HZ Operation, insert Vio-Yel wire into Pin 4.

Transformer Chart



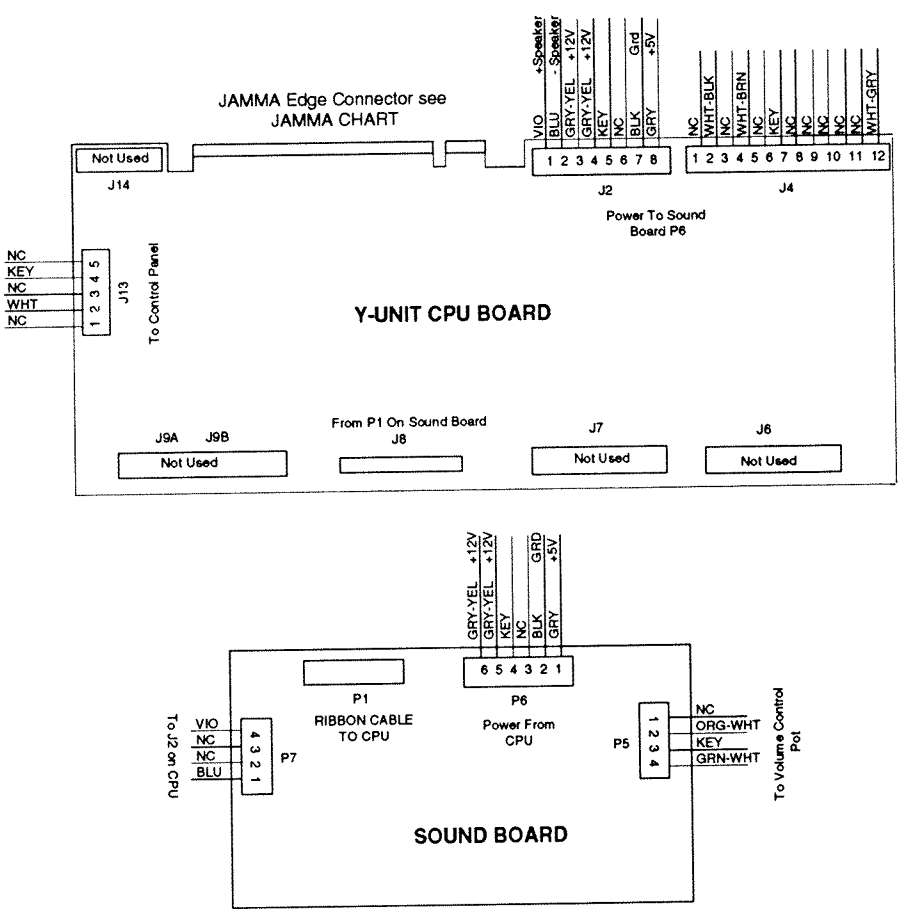
Voltage Selection Table

VOLTAGE	JUMPER PINS
103.5	5 - 6, 7 -8, 10 - 9
115	5 - 6, 7 - 11, 10 - 12
132	5 - 6, 7 - 14, 10 - 15
207	5 - 9, 10 - 8
218.5	5 - 9, 10 - 11
230	5 -12, 10 -11
247	5 - 12, 10 -14

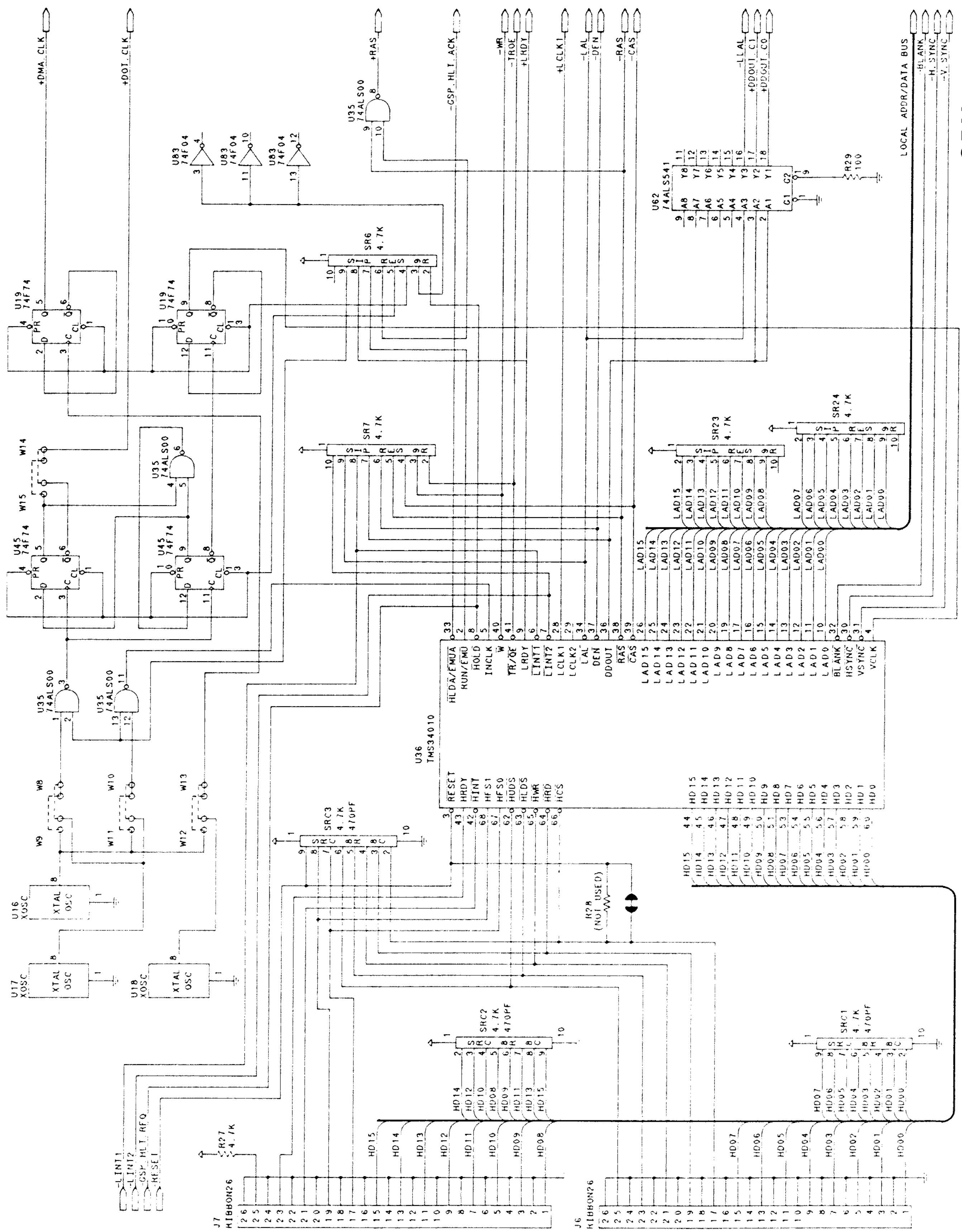
JAMMA CHART

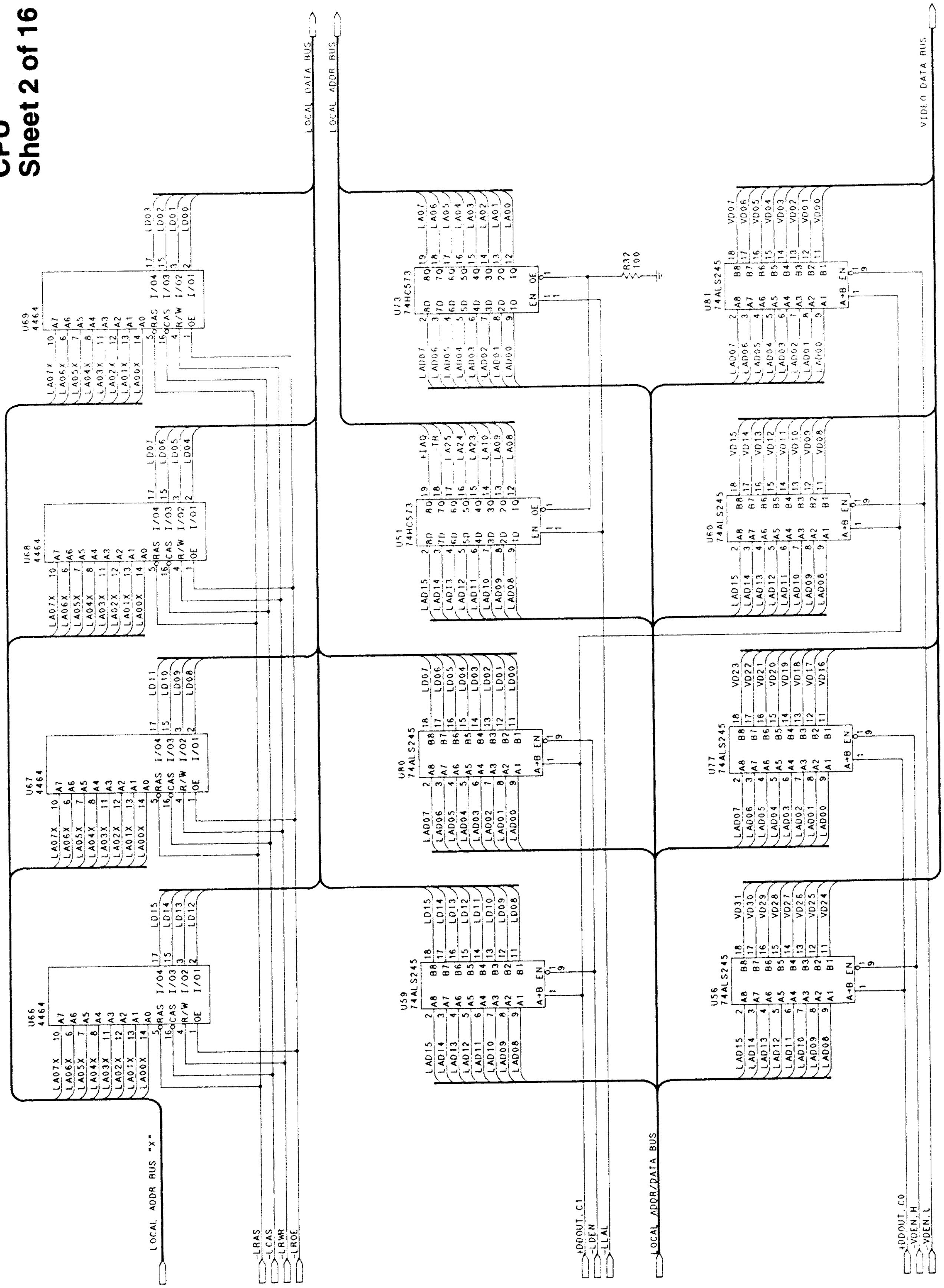
Function	Wire Color	Pin	Pin	Wire Color	Function
Ground	Black	1	A	Black	Ground
Ground	Green-Brown	2	B	Black	Ground
+5 Volts DC	Gray	3	C	Gray	+5 Volts DC
+5 Volts DC	Gray	4	D	Gray	+5 Volts DC
-5 Volts DC	Gray-Green	5	E	Gray-Green	-5 Volts DC
+12 Volts DC	Gray-Yellow	6	F	Gray-Yellow	+12 Volts DC
	Key	7	H	Key	
Counter 1	White-Orange	8	J	White-Green	Counter 2
	NC	9	K	NC	
Speaker (+)	Red-Violet	10	L	Green-Violet	Speaker (-)
	NC	11	M	NC	
Video Red	Red	12	N	Green	Video Green
Video Blue	Brown	13	P	White	Video Sync
Video Ground	Shield	14	R	White-Red	Service Credit
Test	Green	15	S	White-Violet	Slam Tilt
1 Coin	White-Blue	16	T	Yellow-White	2 Coin
1 Start	Yellow-Green	17	U	Yellow-Blue	2 Start
1 Up Move	Orange-Black	18	V	Yellow-Black	2 Up Move
1 Down Move	Orange-Brown	19	W	Yellow-Brown	2 Down Move
1 Left Move	Orange-Red	20	X	Yellow-Red	2 Left Move
1 Right Move	Orange	21	Y	Yellow-Orange	2 Right Move
1 Up Fire	Orange-Yellow	22	Z	Yellow-Violet	2 Up Fire
1 Down Fire	Orange-Green	23	a	Yellow-Gray	2 Down Fire
1 Left Fire	Orange-Blue	24	b	Violet-Black	2 Left Fire
1 Right Fire	Orange-Violet	25	c	Violet-Brown	2 Right Fire
NU	Orange-Gray	26	d	Violet-Red	NU
	NC	27	e	NC	
Ground	Black	28	f	Black	Ground

INTERBOARD WIRING DIAGRAM

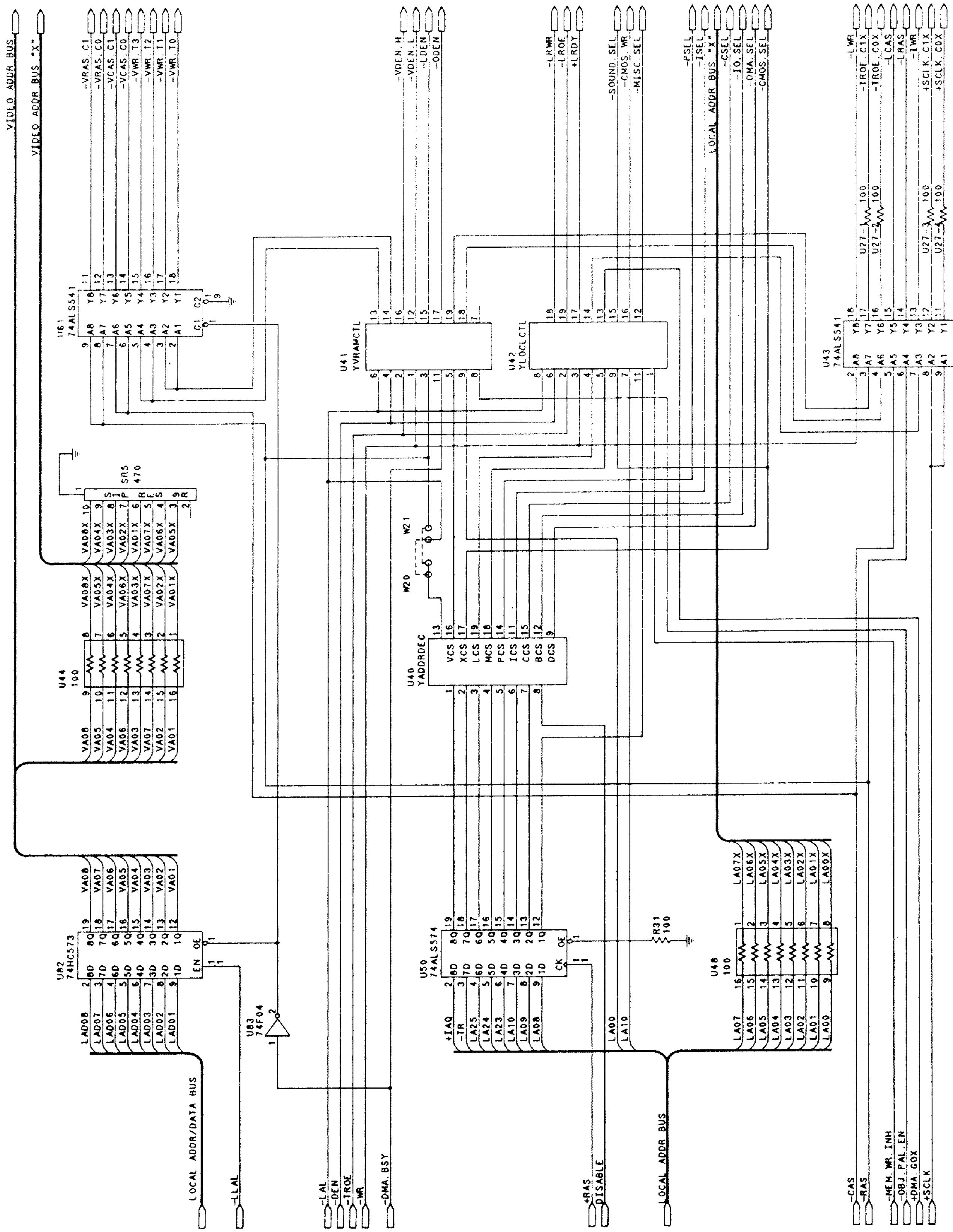


CPU Sheet 1 of 16

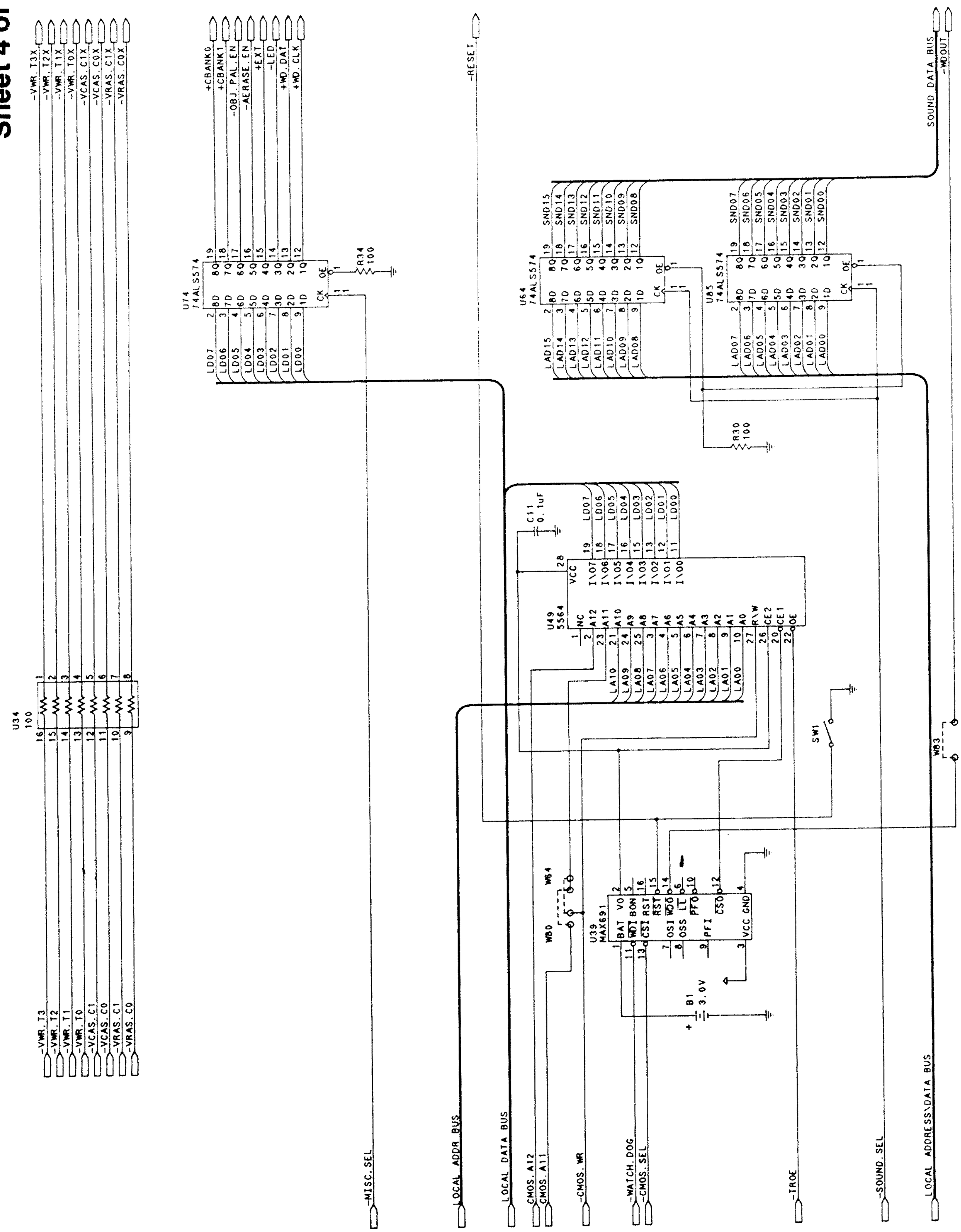


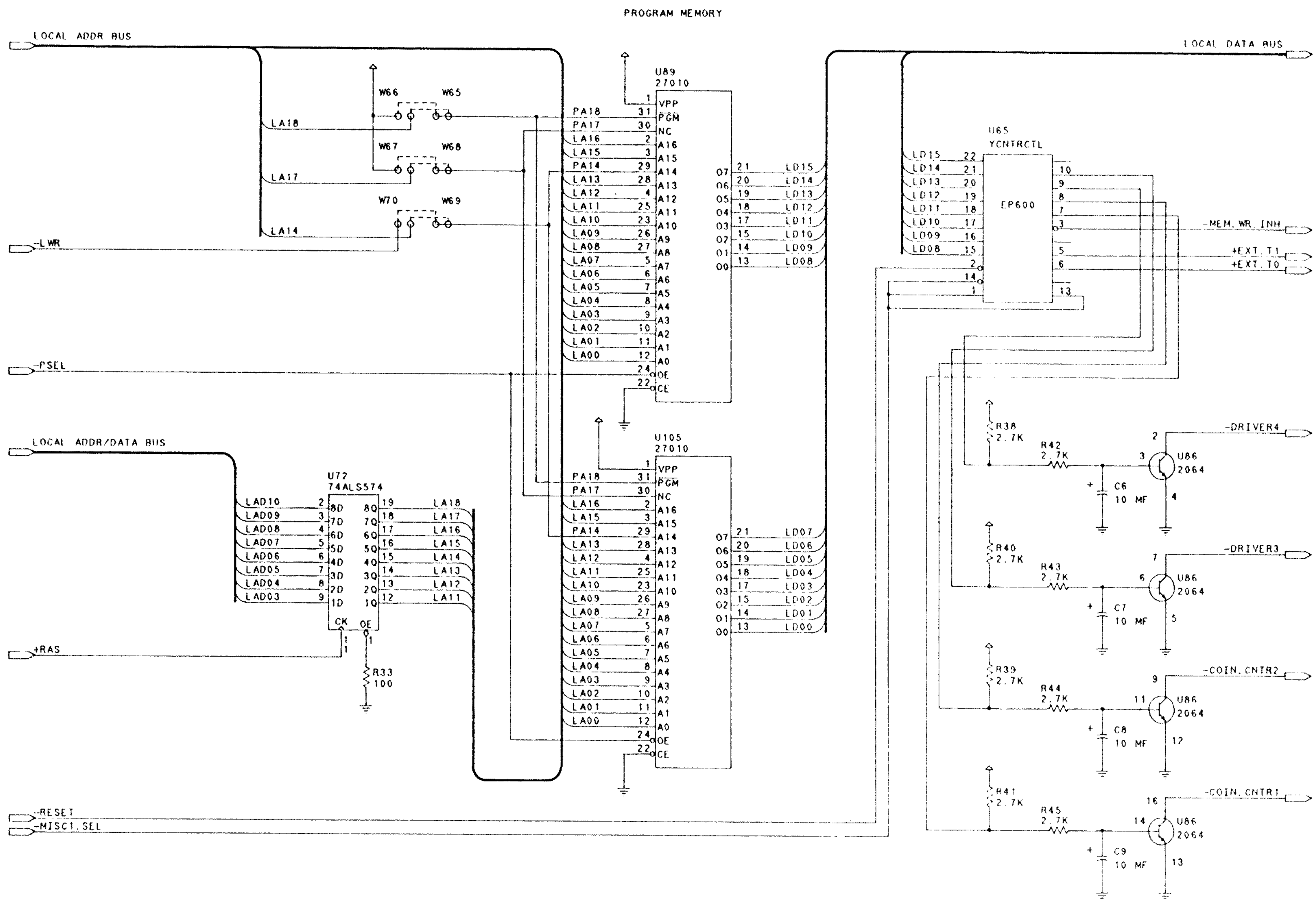

LOCAL DATA BUS
LOCAL ADDR BUS
VIDEO DATA BUS
LOCAL ADDR BUS "X"
LOCAL ADDR/DATA BUS
-LRAS
-LCAS
-LRWR
-LROE
+DDOUT_C1
-LDEN
-LLAL
+DDOUT_C0
-VDEN_H
-VDEN_L
U66 4464
U67 4464
U68 4464
U69 4464
U59 74ALS245
U80 74ALS245
U51 74HC573
U73 74HC573
U56 74ALS245
U77 74ALS245
U60 74ALS245
U81 74ALS245
R32 100

CPU Sheet 3 of 16



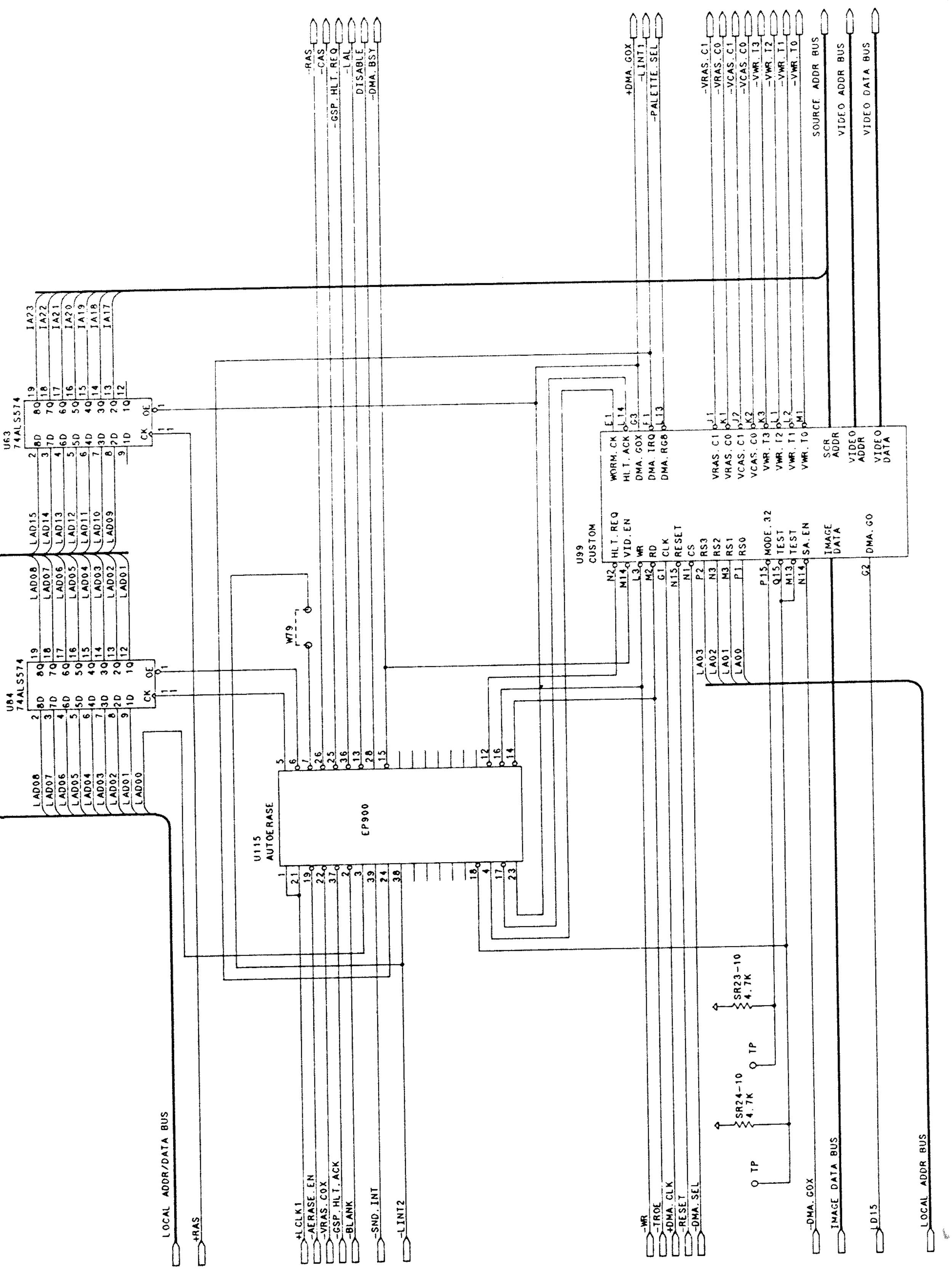
CPU
Sheet 4 of 16

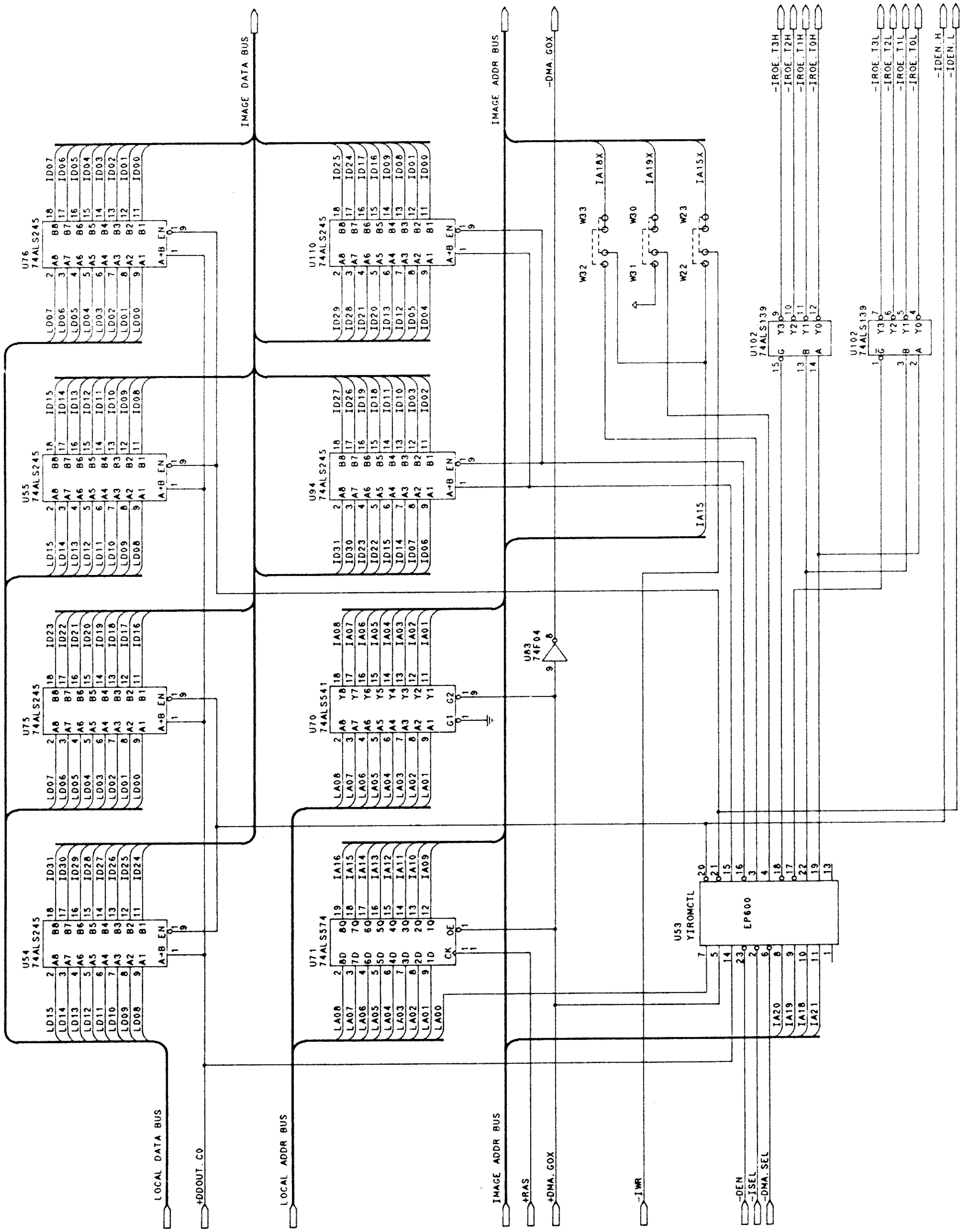




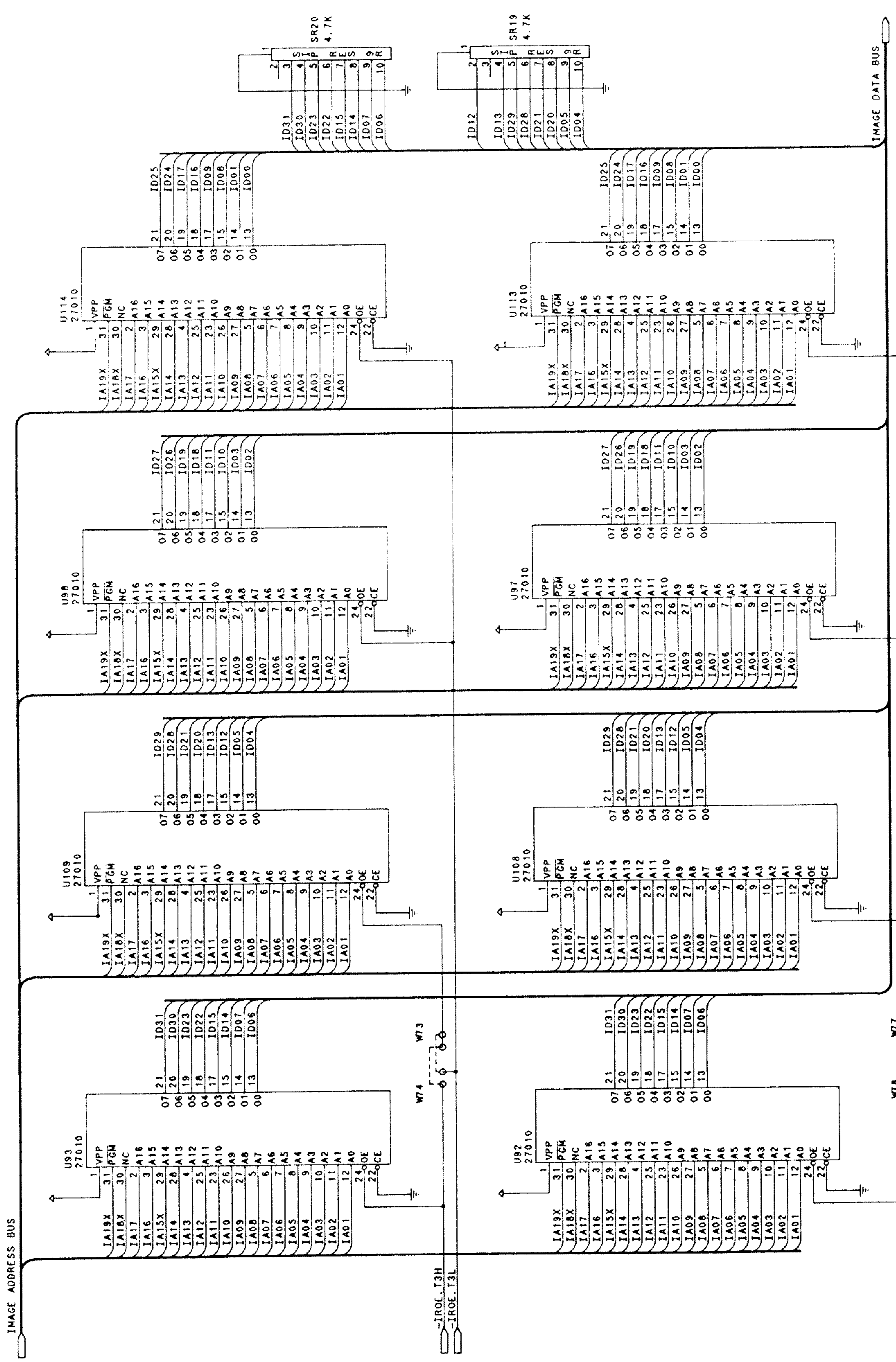
CPU
Sheet 5 of 16

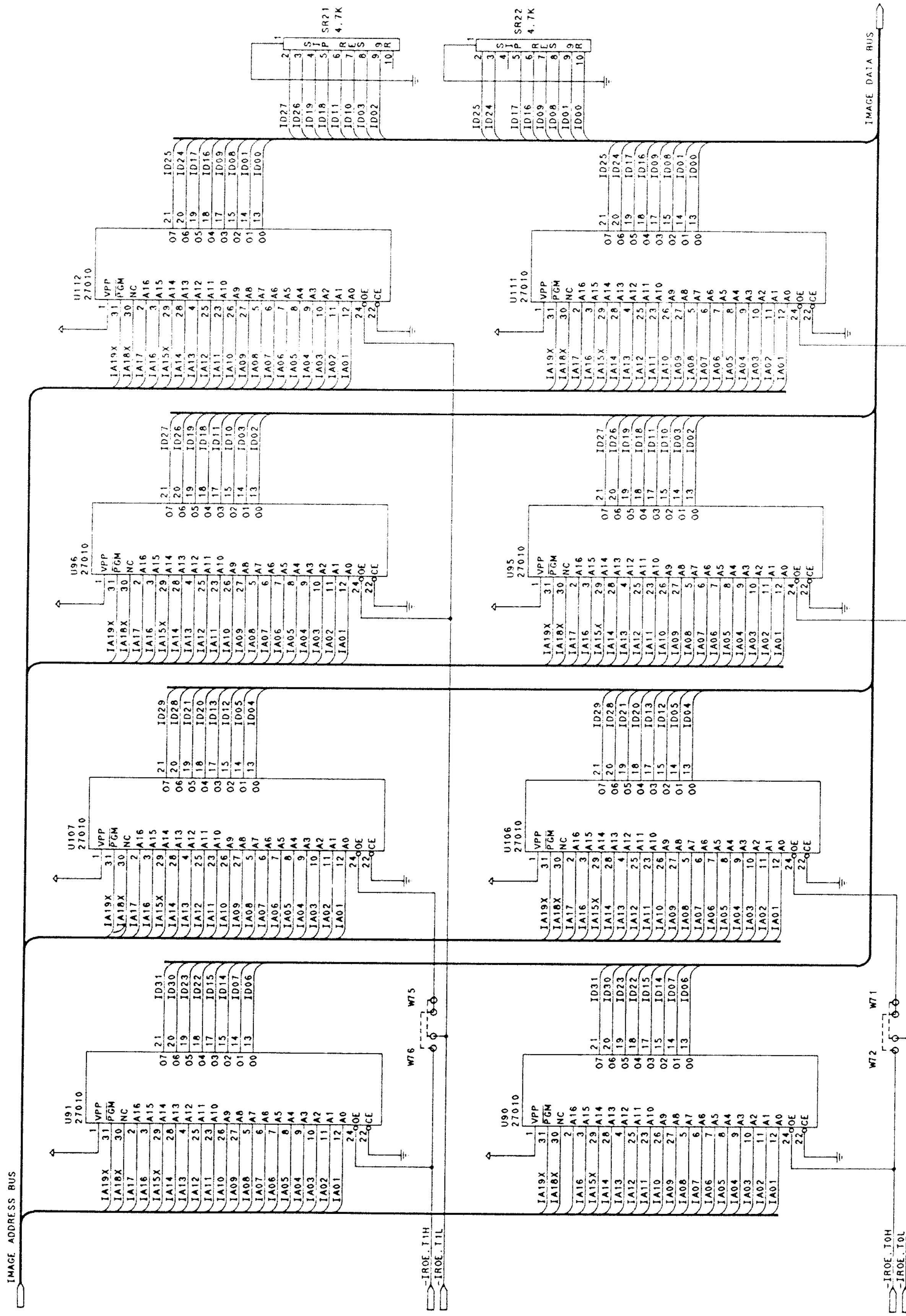
CPU
Sheet 6 of 16





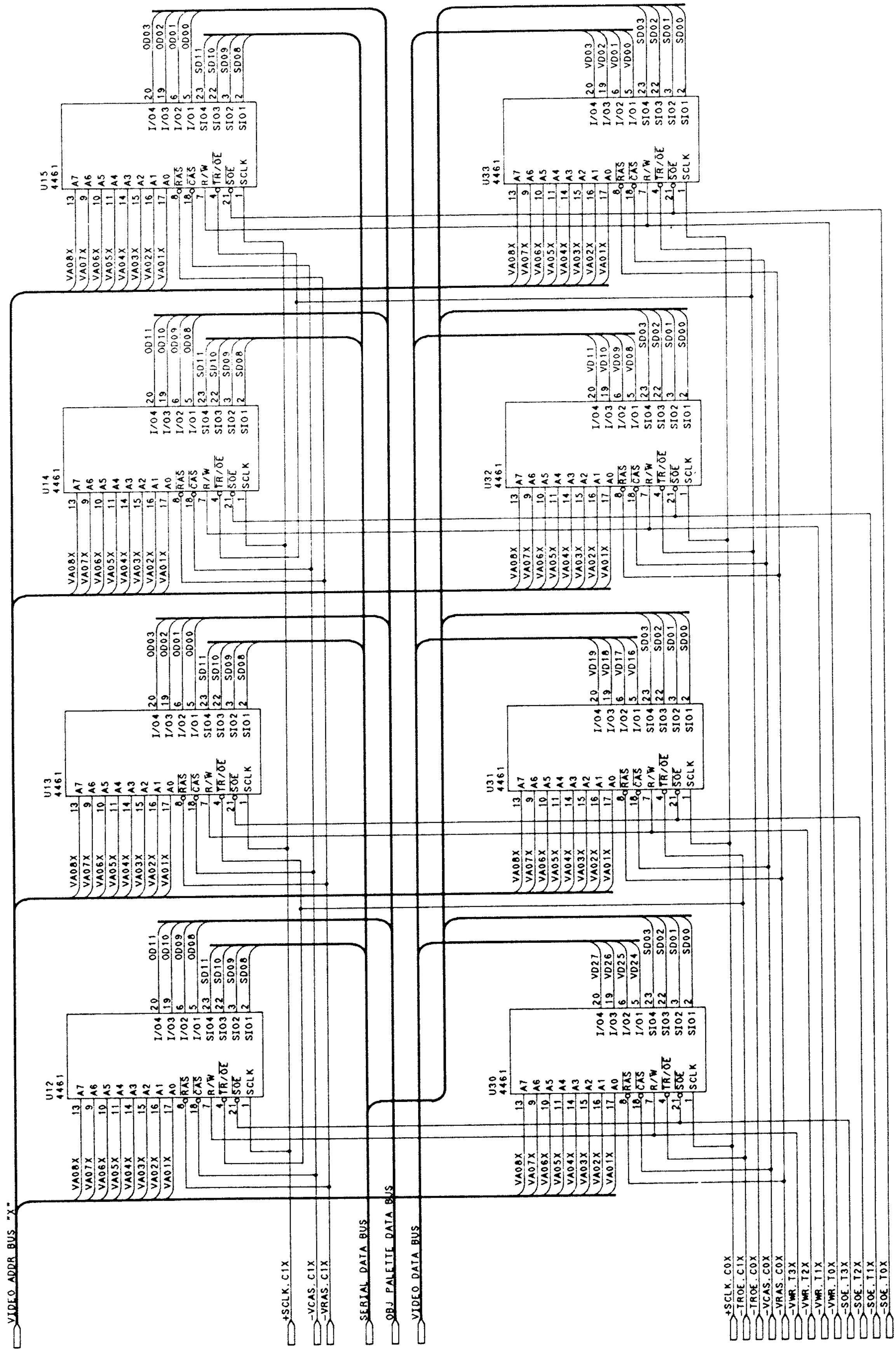
CPU
Sheet 7 of 16

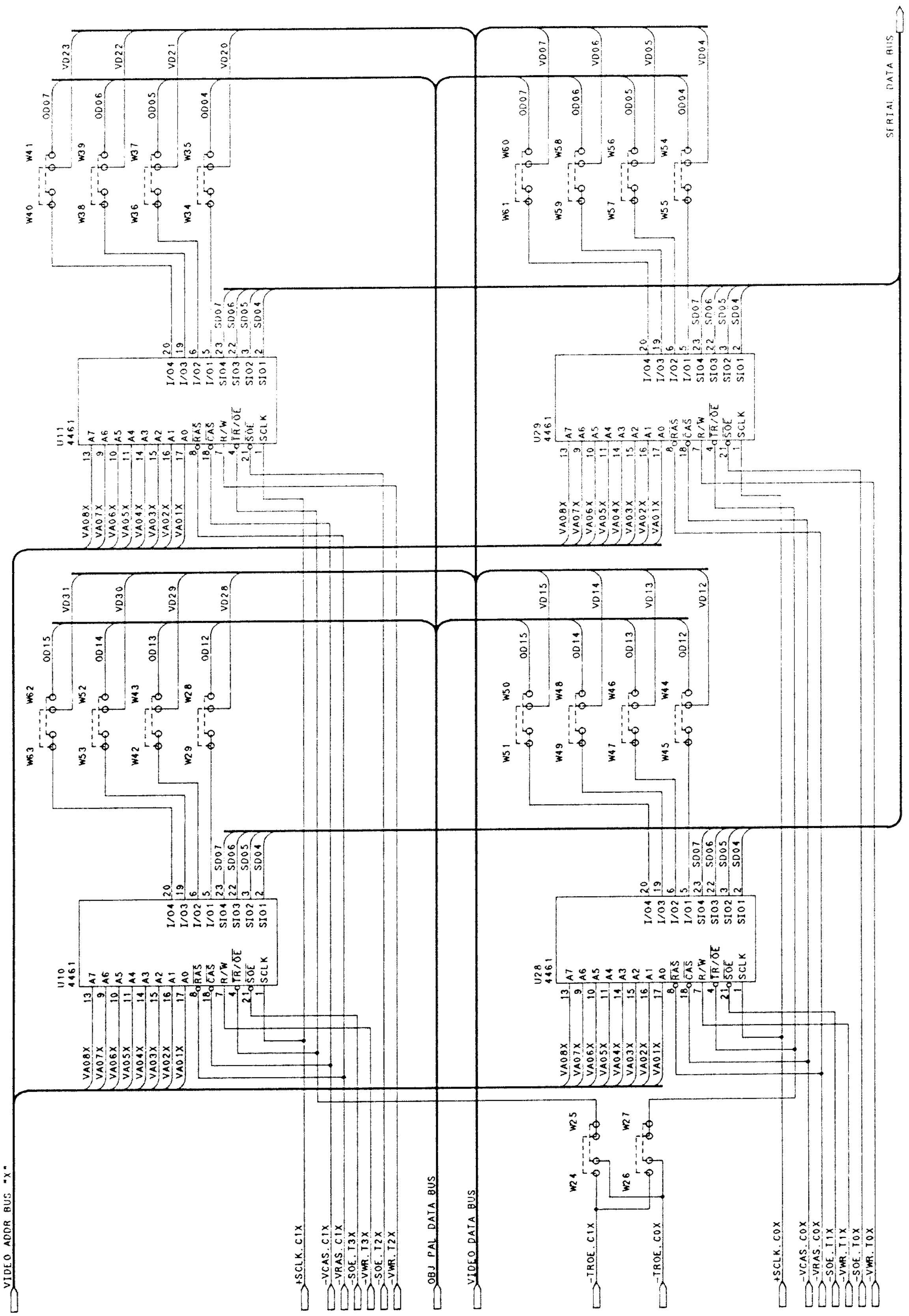

IMAGE MEMORY
IMAGE ADDRESS BUS
IMAGE DATA BUS
U114
27010
U113
27010
U98
27010
U97
27010
U109
27010
U108
27010
U93
27010
U92
27010
SR20
4.7K
SR19
4.7K
W73
W74
W77
W78
-IROE.T3H
-IROE.T3L
-IROE.T2H
-IROE.T2L



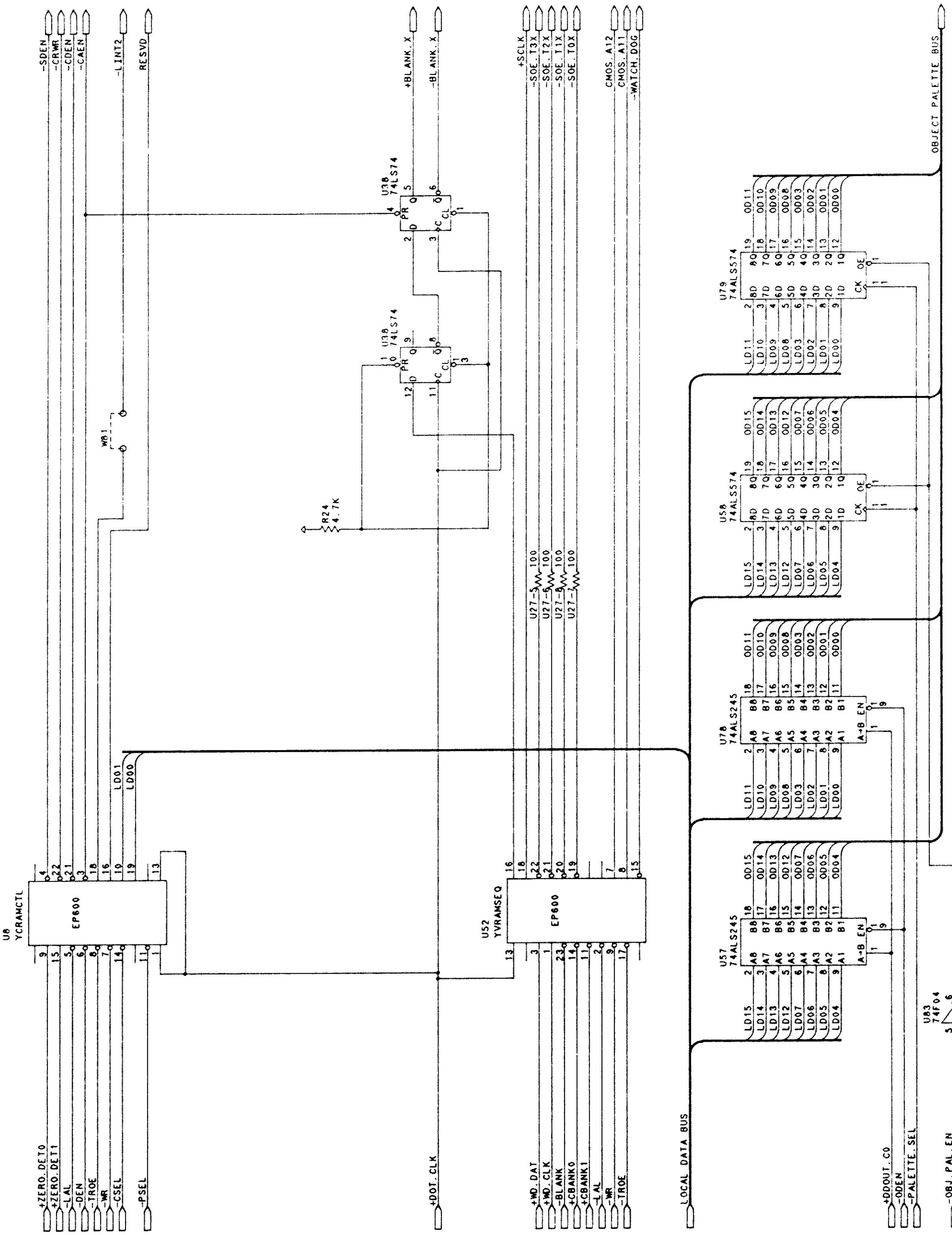
CPU
Sheet 9 of 16

CPU
Sheet 10 of 16

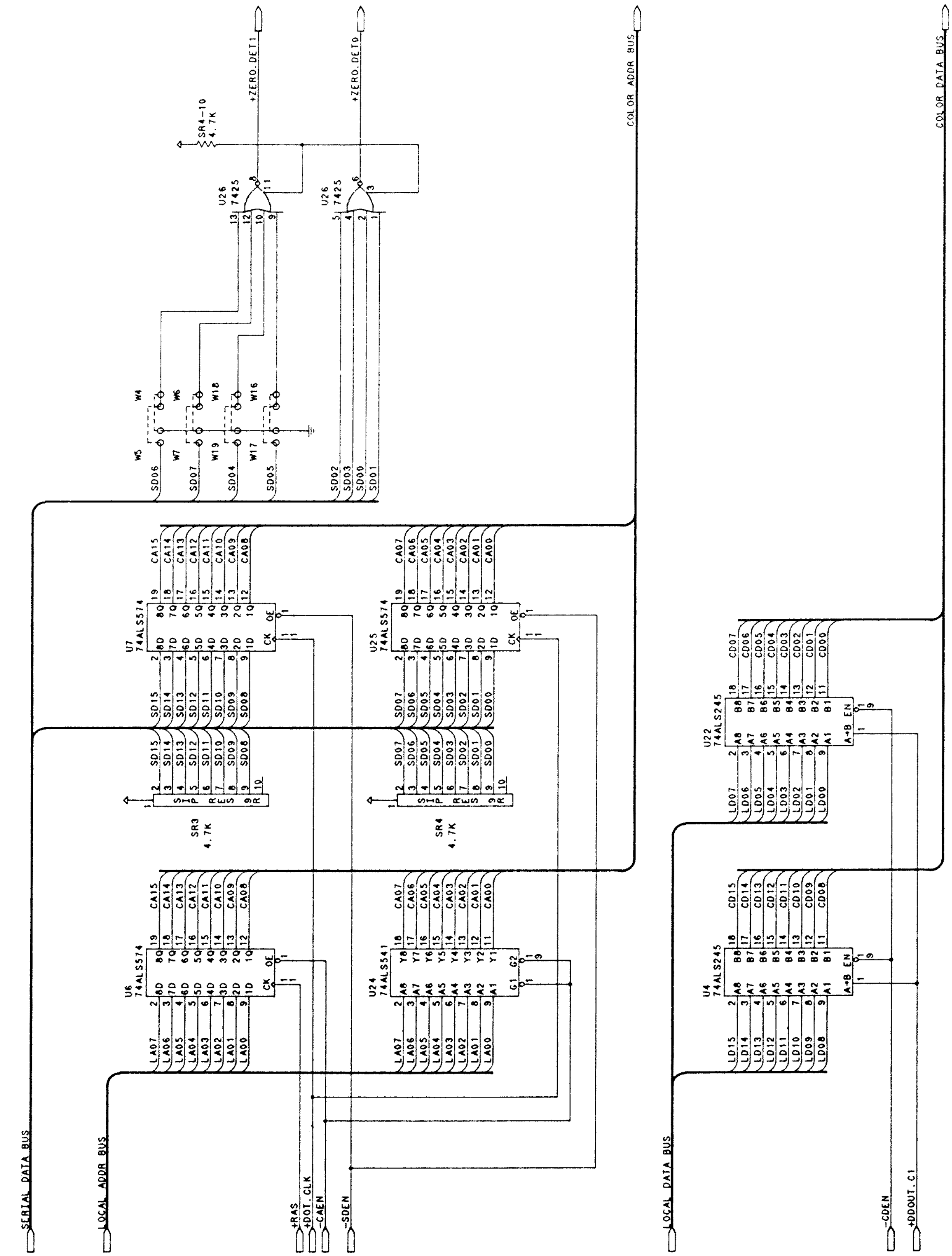


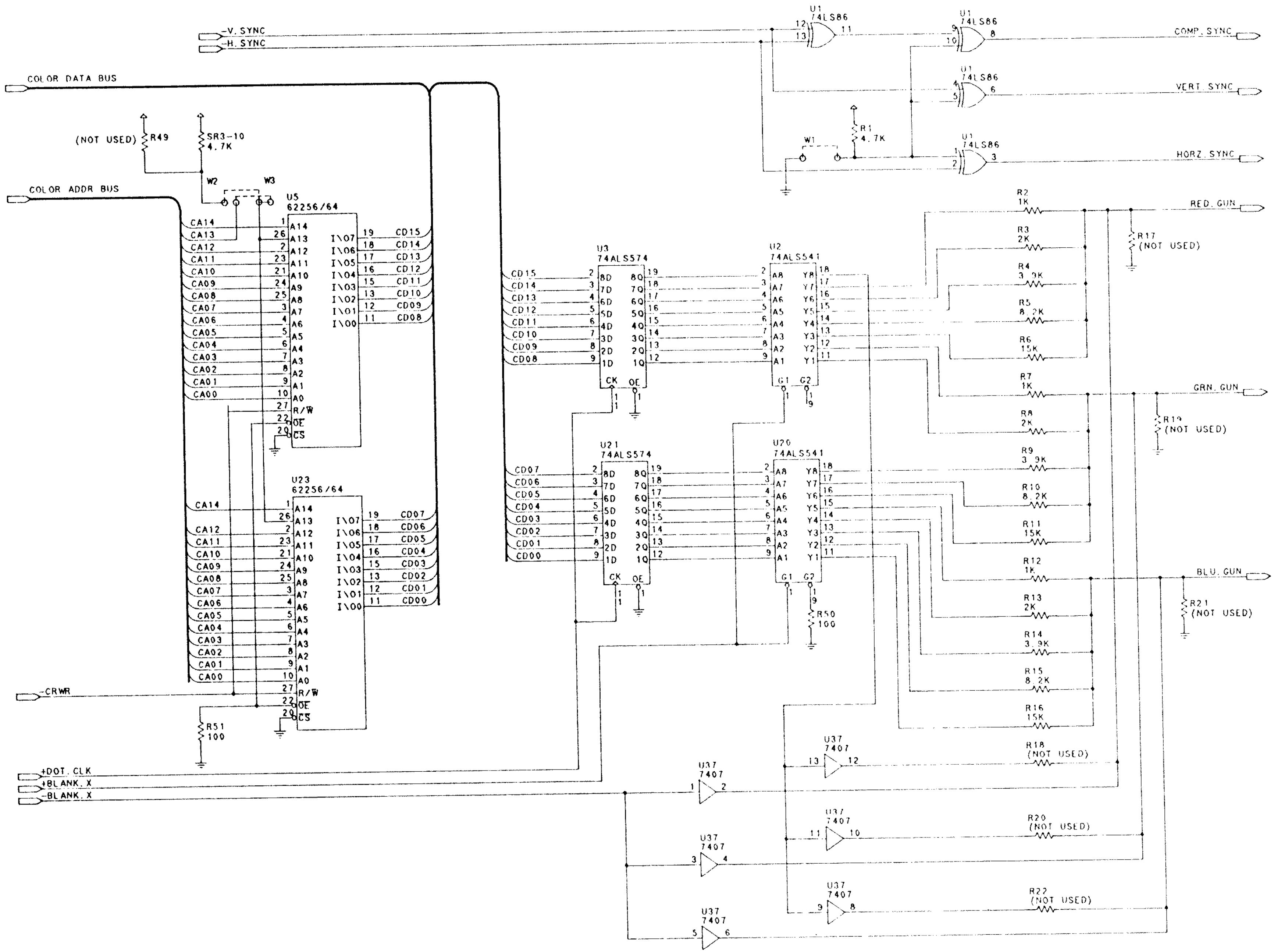


CPU
Sheet 11 of 16

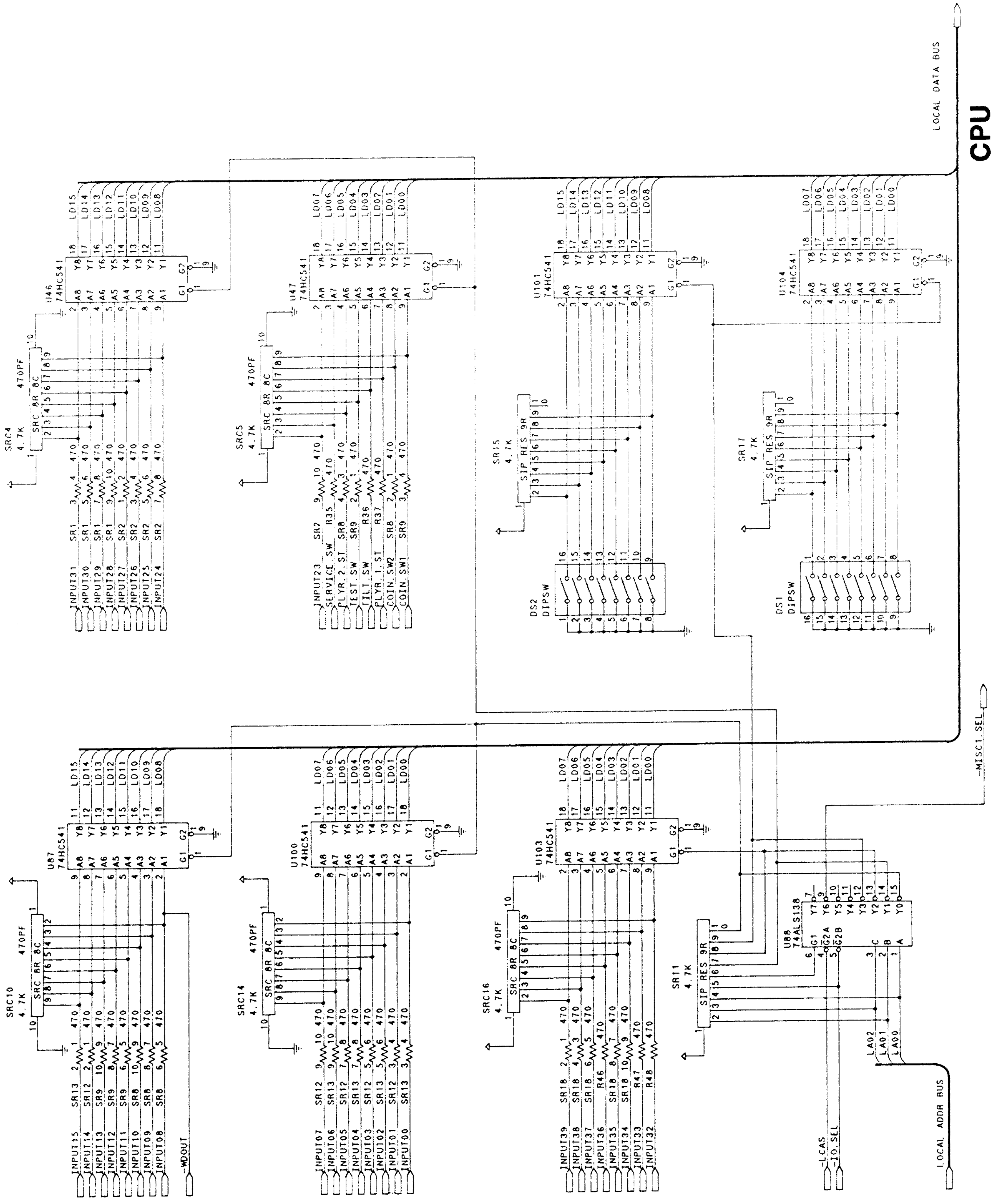

U8
YCRAMCTL
EP600
U52
YVRAMSEQ
EP600
U38
74LS74
U57
74ALS245
U78
74ALS245
U58
74ALS574
U79
74ALS574
U83
74F04
R24
4.7K
W81
+ZERO.DET0
+ZERO.DET1
-LAL
-DEN
-TROE
-WR
-CSEL
-PSEL
+DOT.CLK
+WD.DAT
+WD.CLK
-BLANK
+CBANK0
+CBANK1
-LAL
-WR
-TROE
LOCAL DATA BUS
+DDOUT.CO
-ODEN
-PALETTE.SEL
-OBJ.PAL.EN
-SDEN
-CRWR
-CDEN
-CAEN
-LINT2
RESVD
+BLANK.X
-BLANK.X
+SCLK
-SOE.T3X
-SOE.T2X
-SOE.T1X
-SOE.T0X
CMOS.A12
CMOS.A11
-WATCH.DOG
OBJECT PALETTE BUS

CPU
Sheet 13 of 16

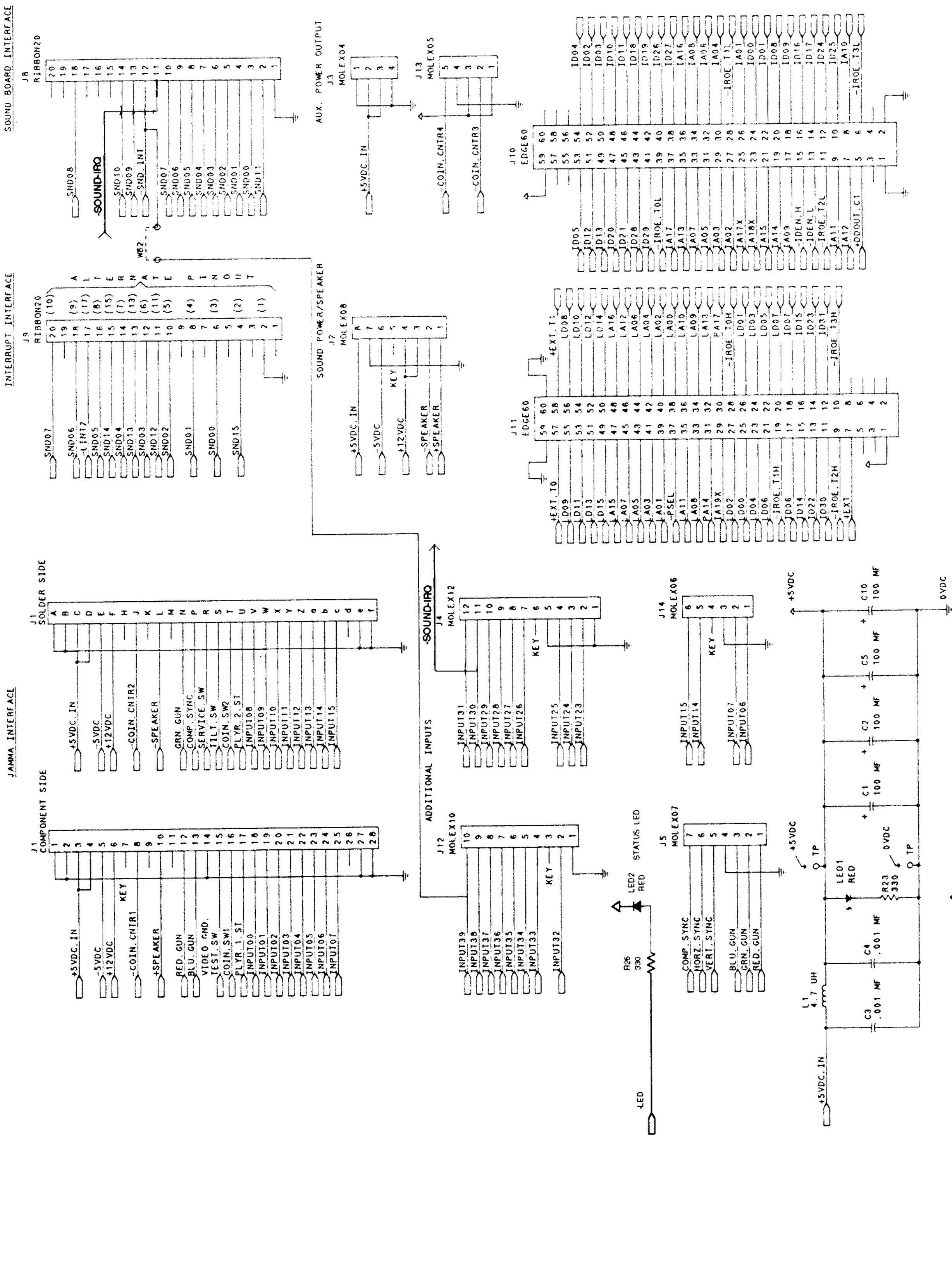


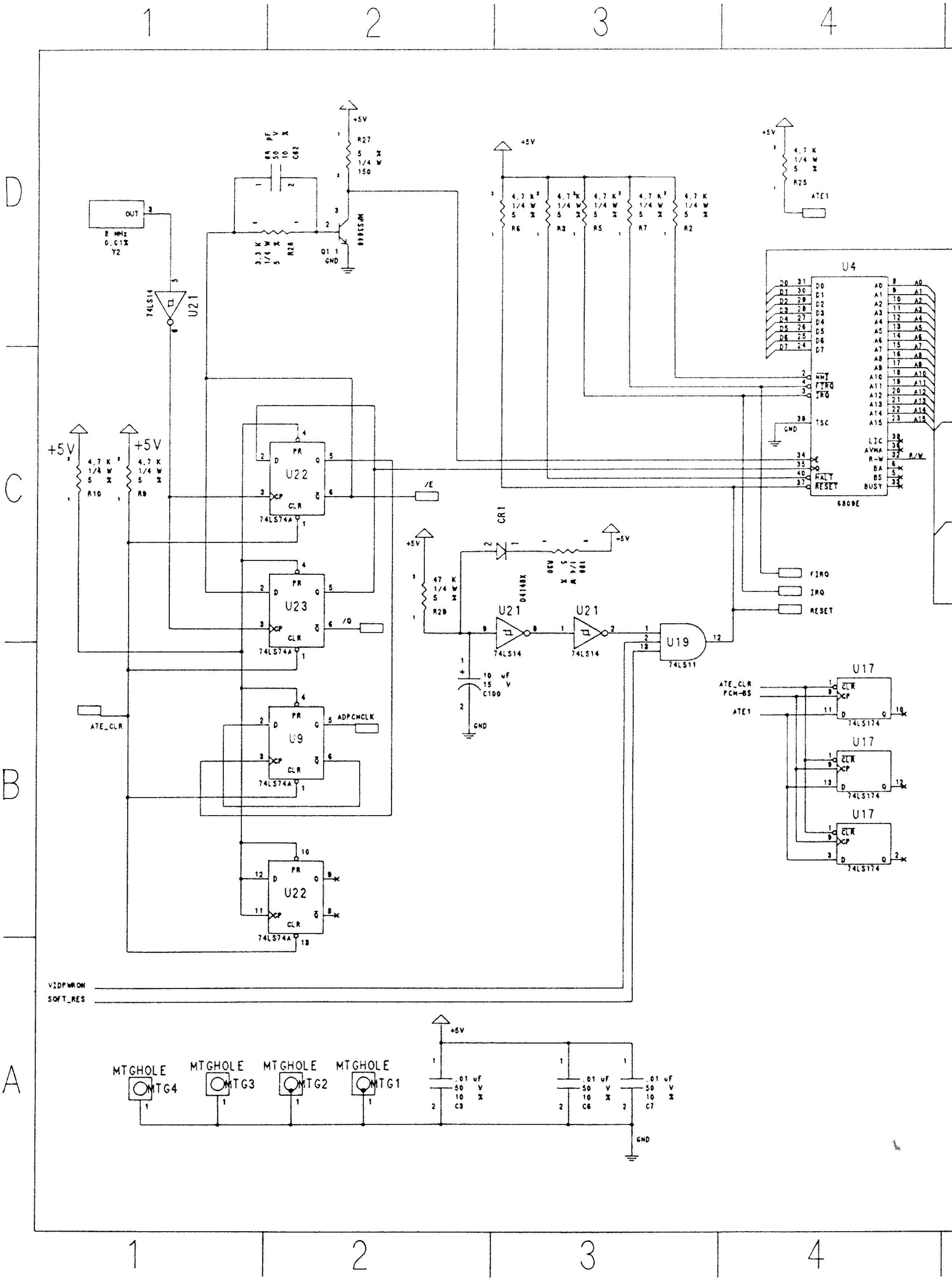

-V. SYNC
-H. SYNC
COLOR DATA BUS
COLOR ADDR BUS
(NOT USED) R49
SR3-10 4.7K
W2
W3
W1
R1 4.7K
U1 74LS86
COMP. SYNC
VERT. SYNC
HORZ. SYNC
U5 62256/64
U23 62256/64
U3 74ALS574
U21 74ALS574
U2 74ALS541
U20 74ALS541
R50 100
R51 100
-CRWR
+DOT. CLK
+BLANK. X
-BLANK. X
U37 7407
R2 1K
R3 2K
R4 3.9K
R5 8.2K
R6 15K
R7 1K
R8 2K
R9 3.9K
R10 8.2K
R11 15K
R12 1K
R13 2K
R14 3.9K
R15 8.2K
R16 15K
R17 (NOT USED)
R19 (NOT USED)
R21 (NOT USED)
R18 (NOT USED)
R20 (NOT USED)
R22 (NOT USED)
RED. GUN
GRN. GUN
BLU. GUN

CPU
Sheet 15 of 16

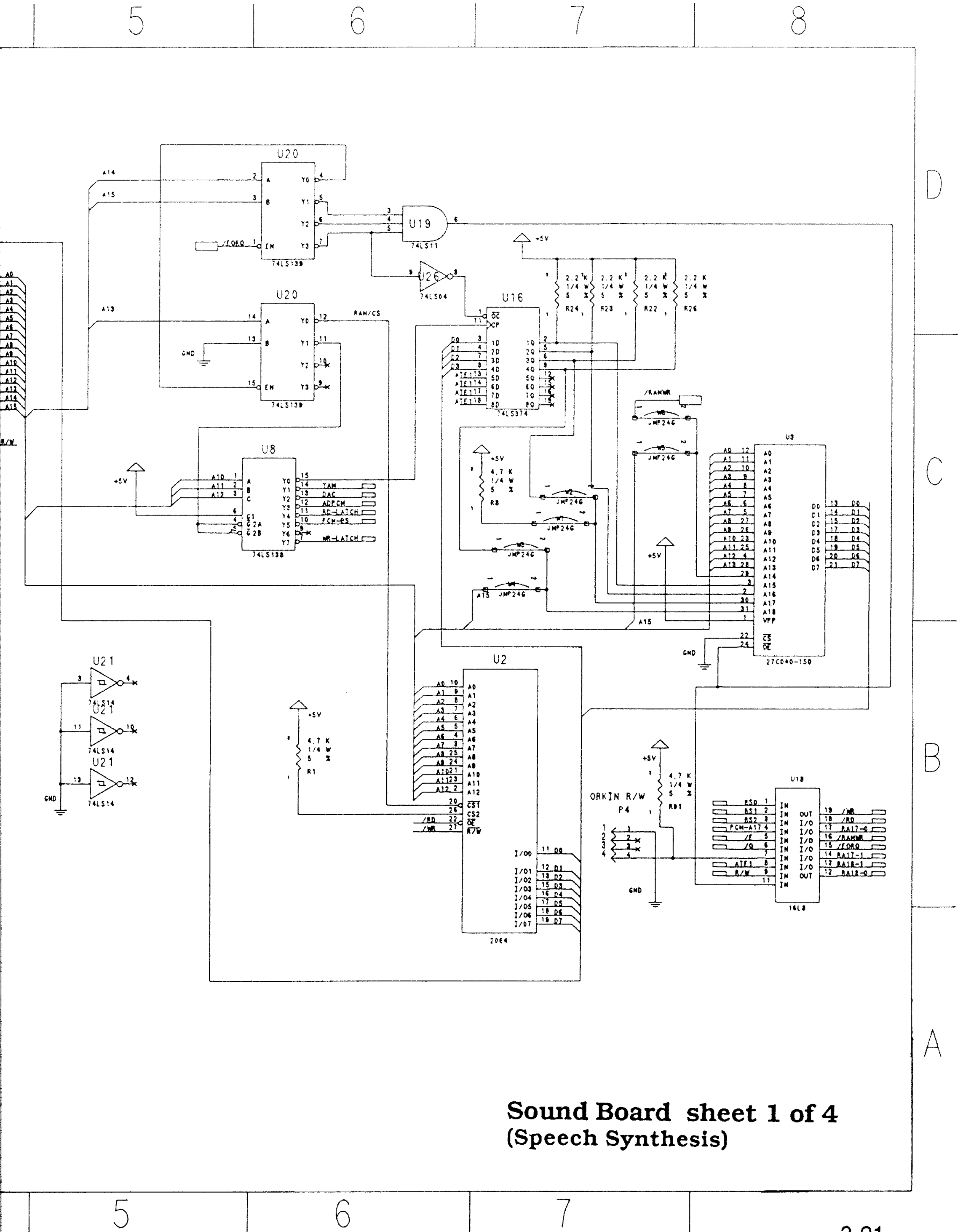


CPU
Sheet 16 of 16

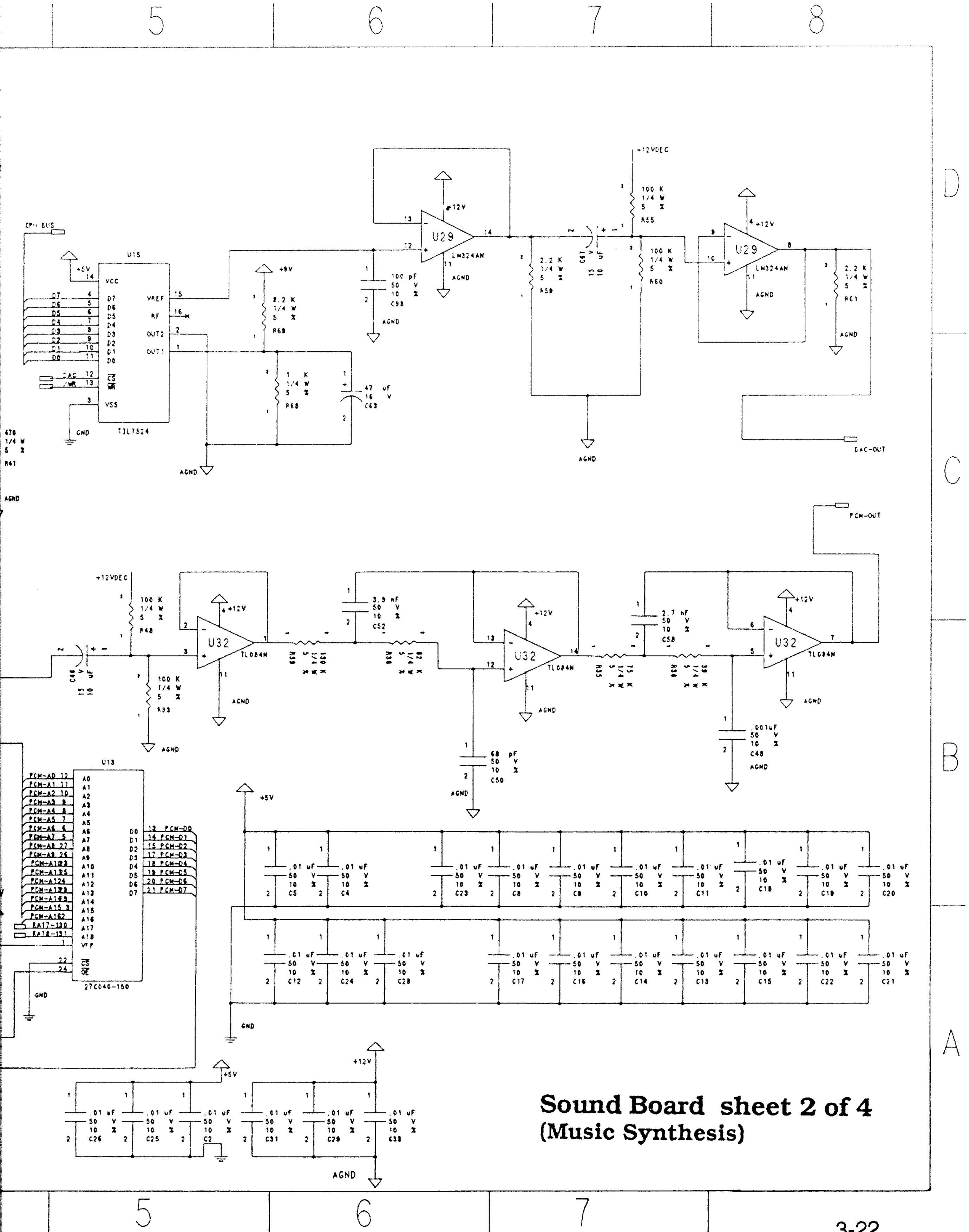




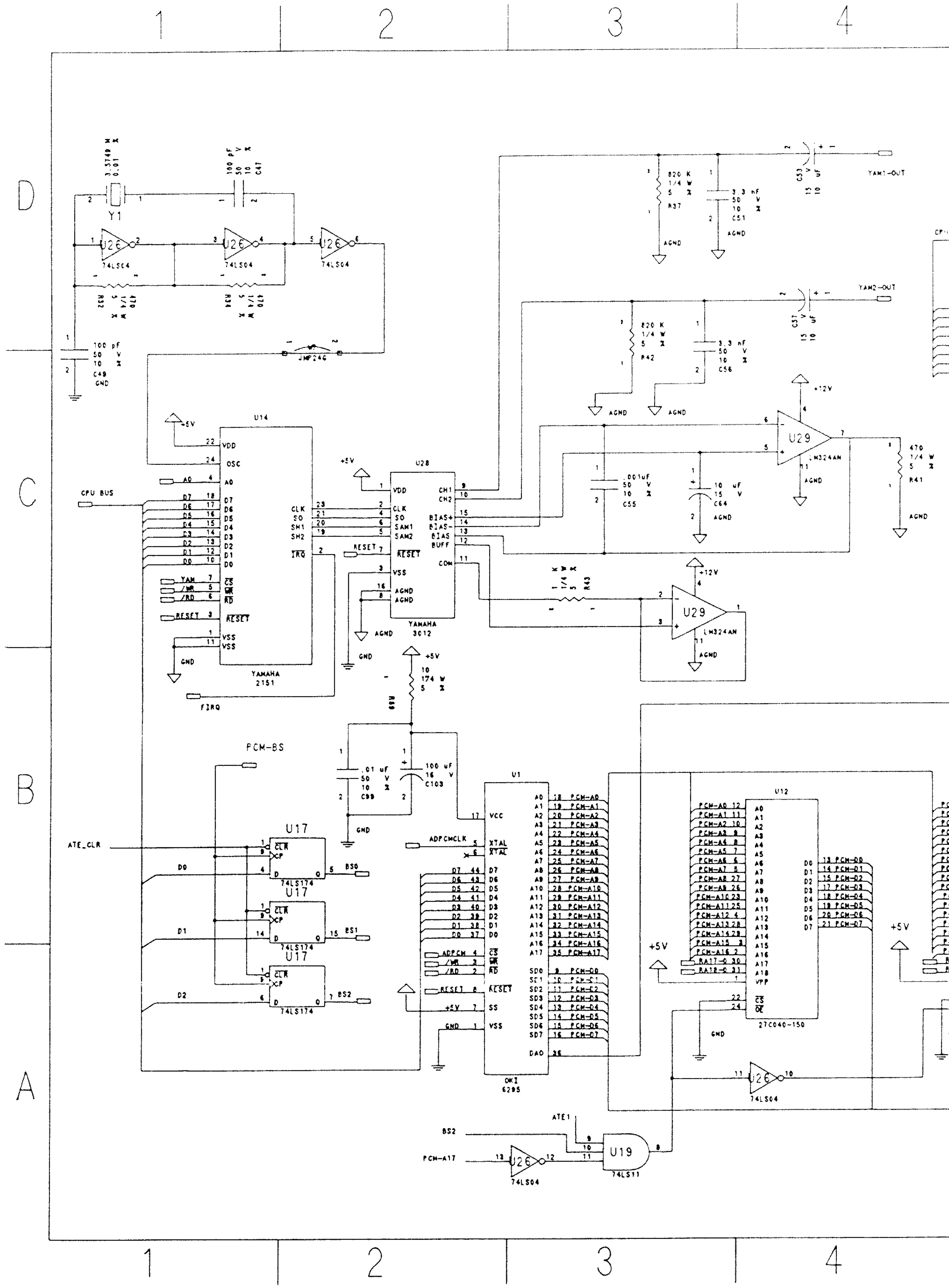
1
2
3
4
D
C
B
A
+5V
R27
5 %
1/4 W
150
68 pF
50 V
10 %
C62
3.3 K
1/4 W
5 %
R28
Q1
MPS3640
GND
OUT
8 MHz
0.01%
Y2
74LS14
U21
4.7 K
1/4 W
5 %
R6
R3
R5
R7
R2
R25
ATE1
U4
D0
D1
D2
D3
D4
D5
D6
D7
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
A13
A14
A15
NMI
FIRQ
IRQ
TSC
LIC
AVMA
R-W
BA
BS
BUSY
E
Q
HALT
RESET
R/W
6809E
R10
R9
PR
CLR
D
CP
Q
U22
74LS74A
/E
U23
/Q
U9
ADPCMCLK
ATE_CLR
CR1
D4148X
47 K
R29
10 uF
15 V
C100
U19
74LS11
FIRQ
IRQ
RESET
U17
ATE_CLR
PCM-BS
74LS174
VIDPWRON
SOFT_RES
MTGHOLE
MTG4
MTG3
MTG2
MTG1
.01 uF
50 V
10 %
C3
C6
C7



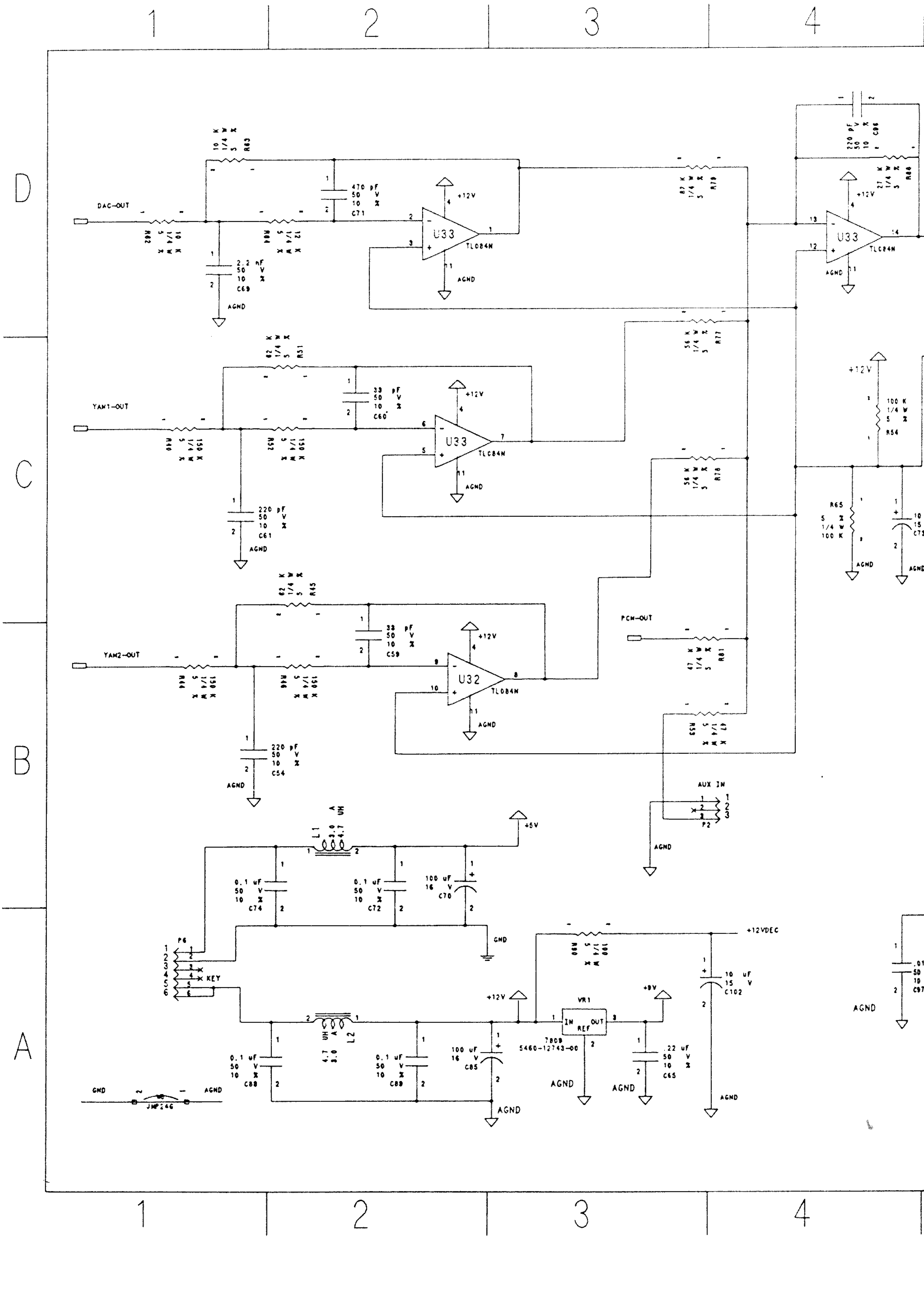
Sound Board sheet 1 of 4
(Speech Synthesis)



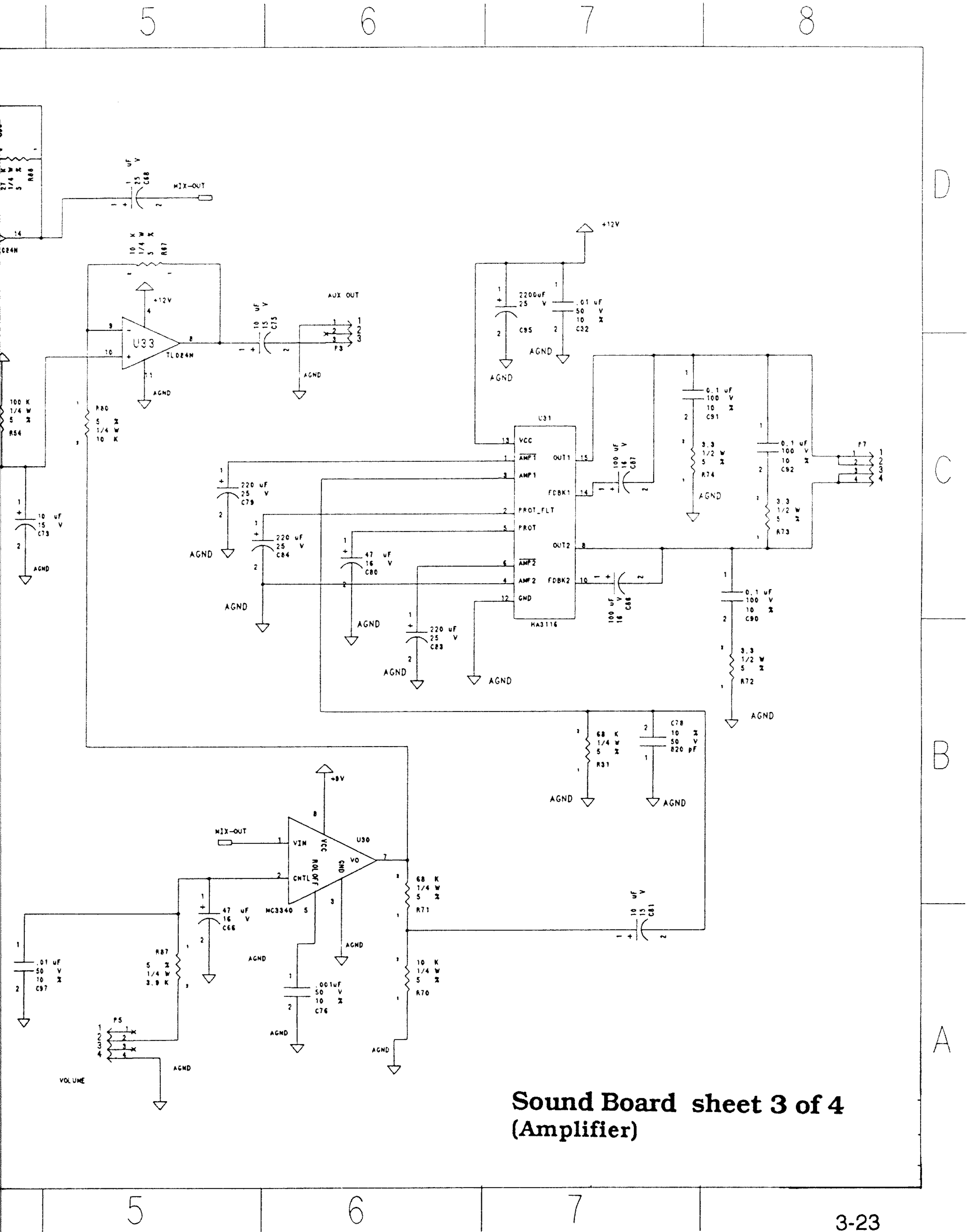
Sound Board sheet 2 of 4
(Music Synthesis)



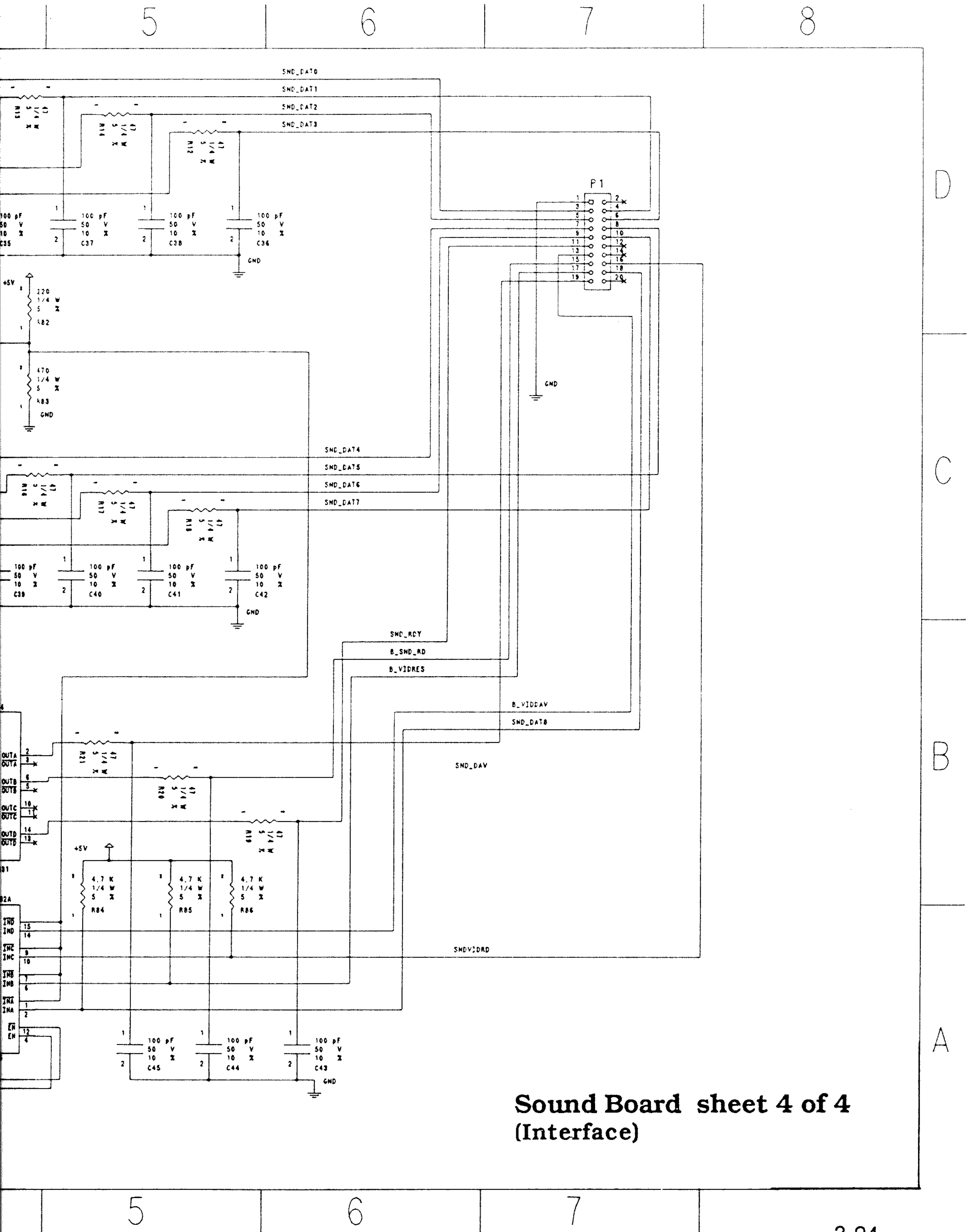
Y1
U26
74LS04
JMP246
U14
YAMAHA
2151
CPU BUS
FIRQ
U28
YAMAHA
3012
U29
LM324AN
YAM1-OUT
YAM2-OUT
PCM-BS
ATE_CLR
U17
74LS174
BS0
BS1
BS2
U1
OKI
6295
ADPCMCLK
U12
27C040-150
U19
74LS11
ATE1
PCM-A17



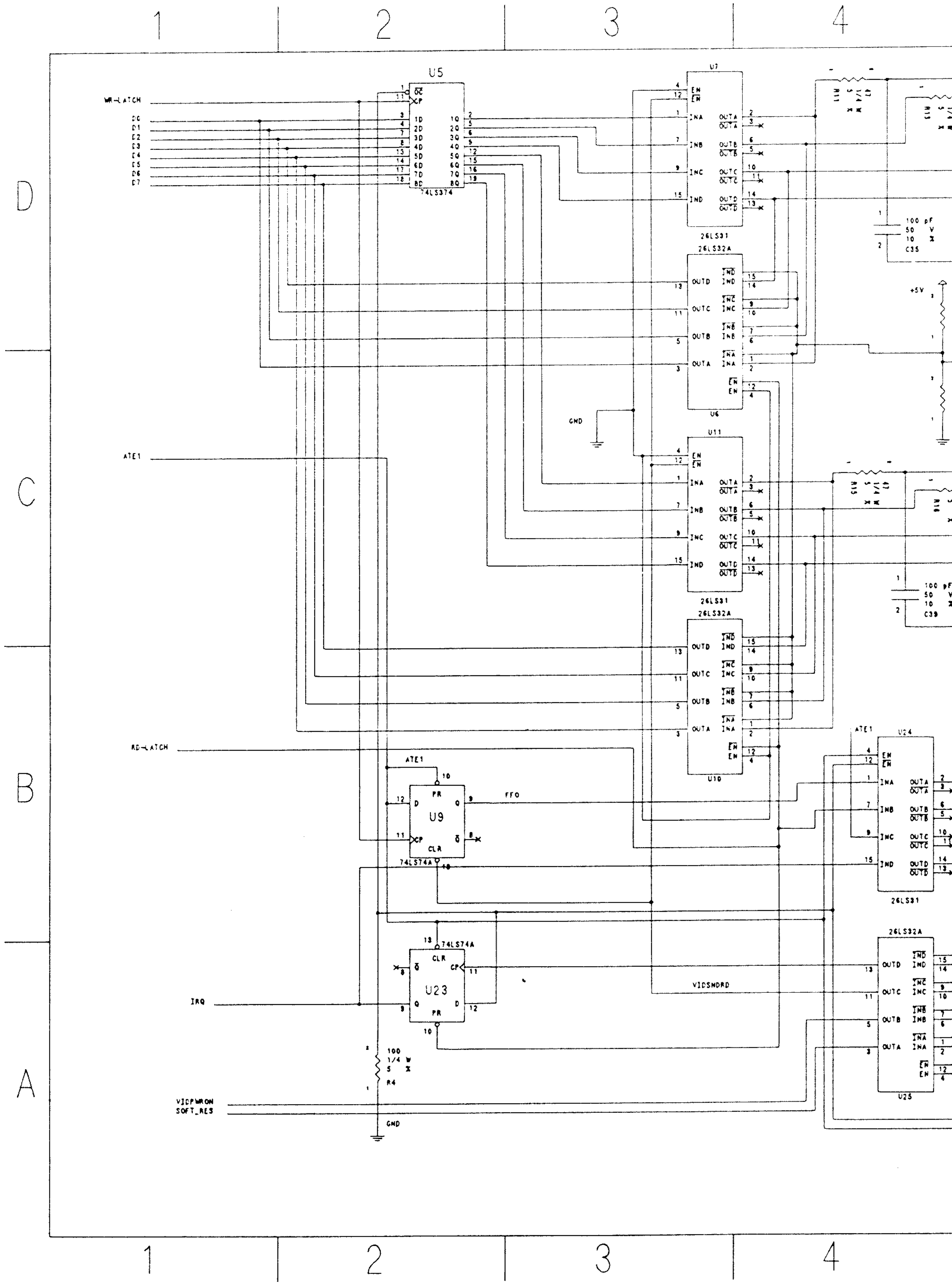
1
2
3
4
D
C
B
A
DAC-OUT
YAM1-OUT
YAM2-OUT
PCM-OUT
AUX IN
U33
U32
TL084N
+12V
+5V
+9V
AGND
GND
+12VDEC
KEY
P6
P2
VR1
7809
5460-12743-00
L1
L2
JMP246
R83
R82
R84
C71
C69
R51
R50
R52
C60
C61
R45
R44
R46
C59
C54
R79
R77
R78
R81
R55
R54
R65
C68
R88
C74
C72
C70
C88
C89
C85
C65
C102
R80



Sound Board sheet 3 of 4
(Amplifier)



Sound Board sheet 4 of 4
(Interface)



U5
74LS374
U7
26LS31
26LS32A
U6
U11
U10
U9
74LS74A
U23
U24
U25
WR-LATCH
ATE1
RD-LATCH
FFO
IRQ
VIDSNDRD
VIDPWRON
SOFT_RES
GND
+5V
C35
C39
R4

Jumper Charts

Sound Board
W2, W3, W5, W7, W8

CPU Board
W2, W8, W11, W12, W14, W21, W22, W24, W27, W29, W31, W32, W34, W36, W39, W41, W42, W45, W47, W48, W50, W52, W55, W57, W58, W60, W62, W66, W68, W69, W71, W73, W75, W77, W80

WARNINGS & NOTICES

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* Substitute parts or modifications may void FCC type acceptance.
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Warning

Prevent shock hazard and assure proper game operation. Only plug this game into a properly grounded outlet. Do not use a cheater plug to defeat the power cord's grounding pin. Do not cut off the ground pin.

Notice

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